User Manual

AIMB-221

Socket S1g1
AMD 64X2 Turion / Mobile
Sempron Processor
HyperTransport Speed 800 MHz
Industrial Mini-ITX Motherboard
with DDR2/Dual GbE/PCI

Trusted ePlatform Services

ADVANTECH

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Caution! *There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

Memory Compatibility

AIMB-221 Memory Tested for Compatibility

Brand	Size	Speed	Type	ECC	Vendor PN	Advantech PN	Memory	Result
A-DATA	256 MB	DDR2 533	SODIMM DDR2	N	M20SS2 F3G3410 A1BOZ	NA	SAMSUNG 52B K4T56083QF-GCD5 (32x8)	PASS
A-DATA	512 MB	DDR2 533	SODIMM DDR2	N	M20EL2 G3H3410 A1BOZ	NA	ELPIDA JAPAN E5108AB-5C-E (64x8)	PASS
Apacer	256 MB	DDR2 533	SODIMM DDR2	N	78.82054 .420	NA	ELPIDA JAPAN E5116AB-5C-E 05050WPWA (64x8)	PASS
Apacer (ROHS)	1 GB	DDR2 667	SODIMM DDR2	N	78.02G6 3.423	96SD2-1G667NN-AP	ELPIDA E5108AGBG-6E-E (64x8)	PASS
DSL (RoHS)	1 GB	DDR2 800	SODIMM DDR2	N	NA	NA	ELPIDA TWN E5108AHSE-8E-E (64x8)	PASS
DSL (RoHS)	2 GB	DDR2 800	SODIMM DDR2	N	NA	NA	ELPIDA JPN E1108ACSE-8E-E (128x8)	PASS
DSL (RoHS)	256 MB	DDR2 667	SODIMM DDR2	N	NA	NA	ELPIDA E5116AF-6E-E (32x16)	PASS
DSL (RoHS)	512 MB	DDR2 667	SODIMM DDR2	N	NA	NA	ELPIDA E5108AGBG-6E-E (64x8)	PASS
DSL (RoHS)	1 GB	DDR2 667	SODIMM DDR2	N	NA	NA	ELPIDA E5108AGBG-6E-E (64x8)	PASS
DSL (RoHS)	2 GB	DDR2 667	SODIMM DDR2	N	NA	NA	ELPIDA E1108ACSE-6E-E (128x8)	PASS
Tran-scend	256 MB	DDR2 533	SODIMM DDR2	N	TS32MS Q64V5M	NA	Hynix HY5PS121621BFP-Y5	PASS
Tran-scend	512 MB	DDR2 533	SODIMM DDR2	N	119833-0266	NA	Infineon HYB18T512 800AF37 SVV39006 0526 (32x8)	PASS
Tran-scend	2 GB	DDR2 533	SODIMM DDR2	N	TS256M SQ64V5U	NA	Micron D9HNL (128x8)	PASS

	256 MB	DDR2 667	SODIMM DDR2	N	TS32MSQ64V6M	NA	Hynix HY5PS121621BFP-Y5	PASS
Tran-scend (RoHS)	512 MB	DDR2 667	SODIMM DDR2	N	TS64MSQ64V6J	NA	SAMSUNG K4T51083QC ZCE6 (64x8)	PASS
	1 GB	DDR2 667	SODIMM DDR2	N	TS128MSQ64V6J	NA	SAMSUNG K4T51083QC ZCE6 (64x8)	PASS
	2 GB	DDR2 667	SODIMM DDR2	N	TS256MSQ64V6U	NA	Micron D9HNL (128x8)	PASS
	1 GB	DDR2 800	SODIMM DDR2	N	TS128MSQ64V8J	NA	HYNIX HY5PS12821E-FP-S5 (64x8)	PASS
	2 GB	DDR2 800	SODIMM DDR2	N	TS256MSQ64V8U	NA	Micron D9HNP (128x8)	PASS
UG	512 MB	DDR2 533	SODIMM DDR2	N	UG64T6400L8SU-5AS	NA	SEC 525 ZC05 K4T51083QC EDE406CB (64x8)	PASS
UG (ROHS)	1 GB	DDR2 667	SODIMM DDR2	N	UG12T6400L8SU-6AP	NA	ELPIDA E5108AG-6E-E (32x16)	PASS

Product warranty

Advantech warrants to you, the original purchaser, that each of its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products which have been repaired or altered by persons other than repair personnel authorized by Advantech, or which have been subject to misuse, abuse, accident or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

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If you think you have a defective product, follow these steps:

1. Collect all the information about the problem encountered. (For example, type of PC, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and list any on-screen messages you get when the problem occurs.

2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.

3. If your product is diagnosed as defective, obtain an RMA (return material authorization) number from your dealer. This allows us to process your return more quickly.

4. Carefully pack the defective product, a fully-completed Repair and Replacement Order Card and a photocopy proof of purchase date (such as your sales receipt) in a shippable container. A product returned without proof of the purchase date is not eligible for warranty service.

5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Initial Inspection

Before you begin installing your motherboard, please make sure that the following materials have been shipped:

■	AIMB-221 AMD 64 X2 Dual Core Mini ITX industrial motherboard	
■	1 AIMB-221 startup manual	P/N: 2006022110
■	1 CD with utility & User's Manual	P/N: 2066022100
■	1 CPU Cooler	P/N: 1750001620
■	1 Ultra ATA 66/100 HDD cable	P/N: 1701400452
■	2 Serial ATA HDD data cable	P/N: 1700003194
■	2 Serial ATA HDD power cable	P/N: 1703150102
■	1 I/O port bracket	P/N: 1960019192T000
■	1 warranty card	P/N: 2190000902

If any of these items are missing or damaged, contact your distributor or sales representative immediately. We have carefully inspected the AIMB-221 mechanically and electrically before shipment. It should be free of marks and scratches and in perfect working order upon receipt. As you unpack the AIMB-221, check it for signs of shipping damage. (For example, damaged box, scratches, dents, etc.) If it is damaged or it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

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Chapter 1

Hardware
Configuration

1.1 Introduction

The AIMB-221 is the most advanced AMD M690T/M690E series industrial mother-board for industrial applications that require high-performance computing. The motherboard supports the mobile and desktop Socket S1g1 Athlon 64/Athlon 64FX/Athlon X2/AMD Sempron/AMD Turion 64 processors with 200, 400, 600, 800, and 1,000 MHz HyperTransport (HT) interface speeds and DDR2 533/667/800 MHz memory up to 4 GB.

The AIMB-221 incorporates the AMD M690T/M690E chipset to offer cost-effective integrated graphics. The M690T/M690E chipset features ATI Radeon^{TM} X1250 3D graphics core to maximize VGA performance with up to 512 MB of shared system memory. In addition, the AIMB-221 has a single/dual Gigabit Ethernet LAN via a dedicated PCIe x1 bus, which offers bandwidth of up to 500 MB/s, eliminating network bottlenecks. High reliability and outstanding performance make the the AIMB-221 the ideal platform for industrial networking applications.

By using the ATI SB600 chipset, the AIMB-221 offers one 32-bit, 33-MHz PCI and a variety of features such as 4 on-board SATA II interfaces (bandwidth = 300 MB/s), 8 USB 2.0 connections; 1 ATA 100/66/33 port; and HD Audio. These powerful I/O capabilities ensure even more reliable data storage capabilities and high-speed I/O peripheral connectivity. When accompanied by Advantech's SNMP-1000 intelligent SNMP/HTTP system manager module, the AIMB-221 permits users to monitor and manage the system remotely. This is particularly crucial for mission-critical applications.

The AIMB-221 also adopts Advantech's unique patented "Sleep Mode Control Circuit" for AT Power Mode.

1.2 Features

- **High Performance I/O Capability:** Dual/single Gigabit LAN via PCIe x1 bus, 1 PCI 32-bit/33 MHz PCI slots, 4 SATA2 connectors and 8 USB 2.0 ports.
- **Standard Mini-ITX form factor with industrial features:** AIMB-221 provides industrial features like long product life, reliable operation under wide temperature range, watchdog timer, CMOS backup functions, etc.
- **Health status monitoring and remote management:** System voltage levels, fan speed and CPU temperature are monitored to ensure stable operation. The remote management interface allows the system to be managed through Ethernet when it is connected to the SNMP-1000 Remote HTTP/SNMP System Manager.
- **BIOS CMOS backup and restore:** When BIOS CMOS setup has been completed, data in the CMOS RAM is automatically backed up to the Flash ROM. This is particularly useful in harsh environments which may cause setup data loss such as battery failure. Upon such an error occurring, the BIOS will check the data, and automatically restore the original data for booting.
- **Automatically power on after power failure:** It is often required to have an unattended system come back to operation when power resumes after a power failure. Advantech's industrial motherboard allows users to set the system to power on automatically without pushing the power on button.

1.3 Specifications

1.3.1 System

- **CPU:** AMD S1g1 Turion 64X2 Dual Core and Mobile Sempron processor up to 2.1/2.0 GHz, HT 800 MHz. Advantech also certifies several optional high-performance CPU coolers for high-speed CPUs in 2U chassis or in high-temperature environments.

  Note! *Advantech offers one CPU Cooler in the standard package. This cooler is capable of keeping the temperature of 35 W-thermal-spec CPUs within specification under the environmental temperatures of 55° C without a chassis or 40° C with a chassis.*

- **L2 Cache:** CPU has one of the following built-in full-speed L2 caches

  1 MB for AMD Turion 64X2 TL-62 and TL56 CPUs,

  512 KB for Mobile AMD Sempron 3700 + CPUs, and

  256 KB for Mobile AMD Sempron 2100 + CPUs.
- **BIOS:** Award 16 Mbit LPC
- **System Chipset:** AMD M690T/M690E with SB600
- **SATA hard disk drive interface:** Four on-board SATA2 connectors support Advanced Host controller interface (AHCI) technology and have data transmission rates up to 300 MB/s.
- **One on-board IDE connector:** Supports PIO mode 4 (16.67 MB/s) and ATA 33/66/100 (33/66/100 MB/s) BIOS enabled/disabled.

1.3.2 Memory

- **RAM:** Up to 4 GB in two 200-pin SO-DIMM sockets. Supports dual-channel DDRII 533/667/800 SDRAM.

  Note! *Due to limitations of the PC architecture, the system may NOT fully detect 4 GB of RAM when 4 GB of RAM is installed.*

1.3.3 Input/Output

- **PCI Bus:** 1 PCI slots, 32-bit, 33 MHz PCI 2.2 compliant
- **Enhanced parallel port:** Configured to LPT1 or disabled. Standard DB-25 female connector provided. Supports EPP/SPP/ECP
- **Serial ports:** Six serial ports, one DB-9 (RS-232) connector and one DB-9 (RS-232/422/485) connector on rear IO, and four onboard pin header (RS-232). Ports can be individually configured to COM1, COM2, COM3, COM4, COM5, COM6 or disabled.
- **Keyboard and PS/2 mouse connector:** Two 6-pin mini-DIN connectors are located on the mounting bracket for easy connection to a PS/2 keyboard and mouse.
- **USB port:** Supports up to eight USB 2.0 ports with transmission rates up to 480 Mbps.

1.3.4 Ethernet LAN

- Supports single/dual 10/100/1000Base-T Ethernet port(s) via PCIe x1 bus which provides a 500 MB/s data transmission rate.
- **Interface:** 10/100/1000Base-T
- **Controller:** LAN1: Realtek RTL8111C, LAN2: Realtek RTL8111C

1.3.5 Industrial features

- **Watchdog timer:** Can generate a system reset or IRQ11. The watchdog timer is programmable, with each unit equal to one second or one minute (255 levels).

1.3.6 Mechanical and environmental specifications

- **Operating temperature:** 0 ~ 60° C (32 ~ 140° F, Depending on CPU)
- **Storage temperature:** -20 ~ 70° C (-4 ~ 158° F)
- **Humidity:** 20 ~ 95% non-condensing
- **Power supply voltage:** +3.3 V, ±5 V, ±12 V
- **Power consumption:** Maximum: +5 V at 3.45 A, +3.3 V at 0.72 A, +12 V at 2.45 A, 5 Vsb at 1 A ((AMD Turion 64X2 processor TL-62 2.1GHz and two 2 GB DDR2 800 SDRAM))
- **Board size:** 170 x 170 mm (6.69" x 6.69")
- **Board weight:** 0.5 kg (1.68 lb)

1.4 Jumpers and Connectors

Connectors on the AIMB-221 motherboard link it to external devices such as hard disk drives and a keyboard. In addition, the board has a number of jumpers that are used to configure your system for your application.

The tables below list the function of each of the jumpers and connectors. Later sections in this chapter give instructions on setting jumpers. Chapter 2 gives instructions for connecting external devices to your motherboard.

1.5 Board Layout: Jumper and Connector Locations
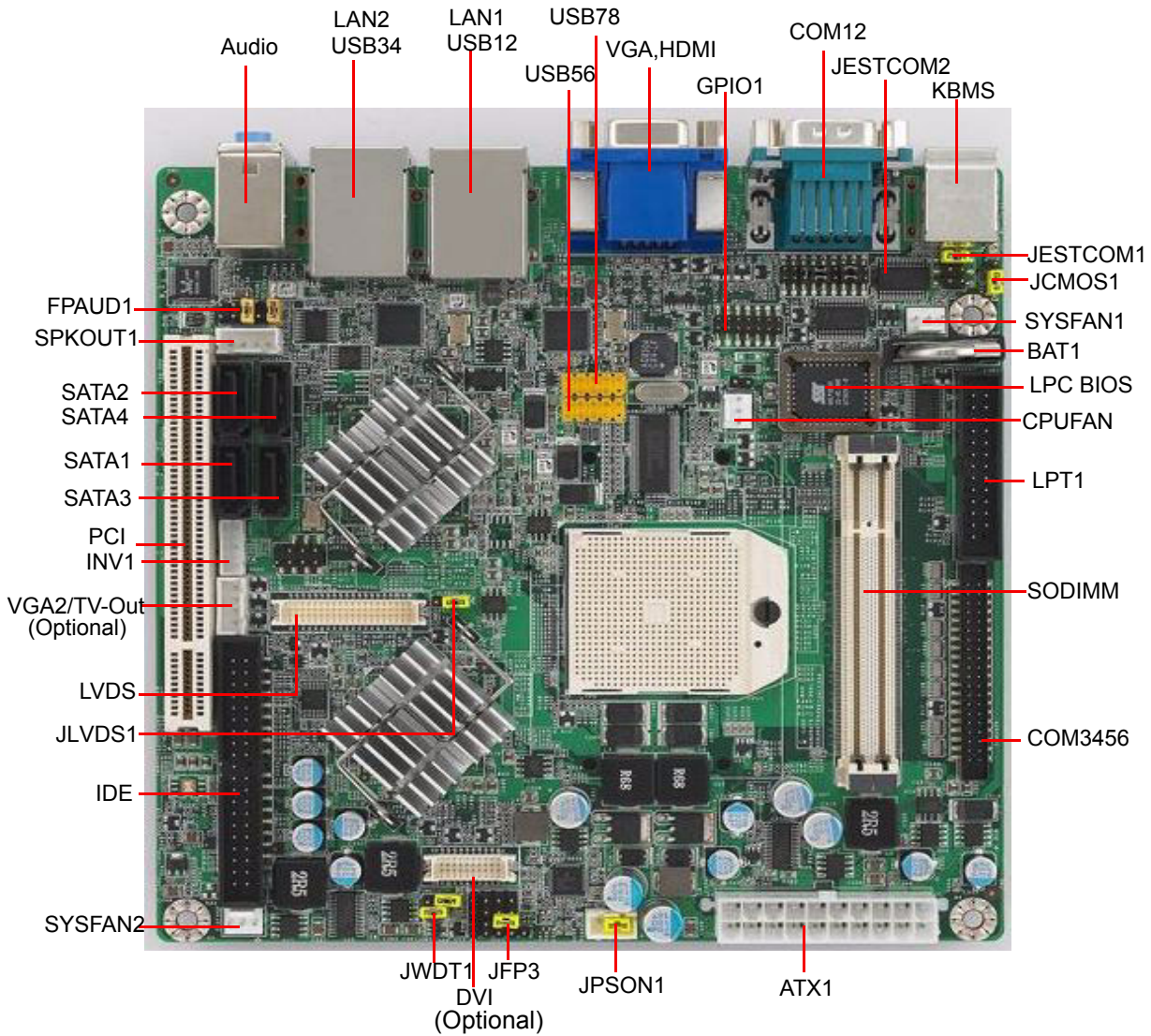
Figure 1.1 Jumper and Connector locations
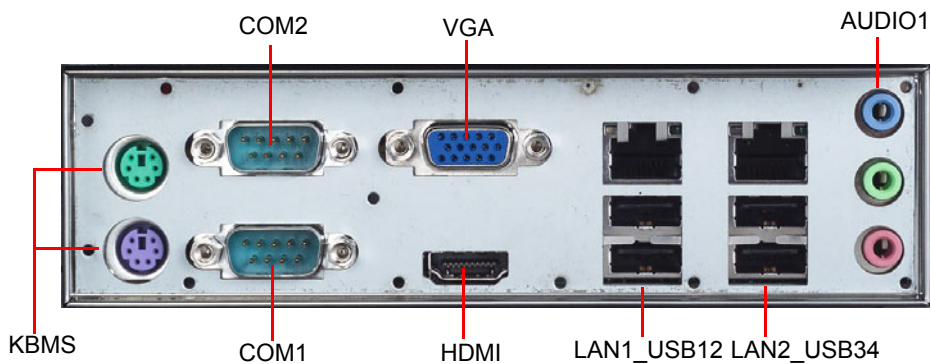
Figure 1.2 I/O connectors

1.6 AIMB-221 Block Diagram
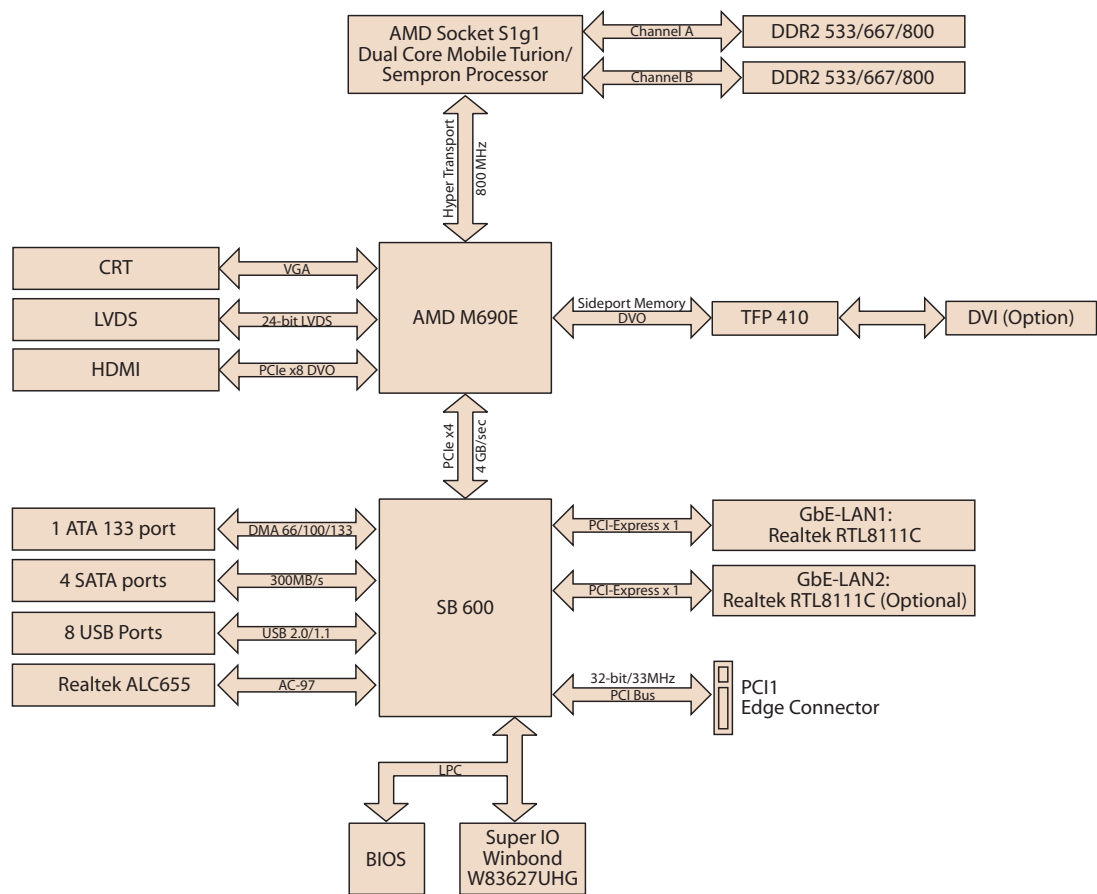
Figure 1.3 AIMB-221 Block Diagram

1.7 Jumpers and Connectors

Label	Function	Page
JCMOS1	Clear CMOS jumper	9
JWDT1	Watchdog timer output	9
JPSON1	Power ATX/AT mode selector	10, 24
JSETCOM1	RS-232 power mode selector for COM1	10, 30
JSETCOM2	RS-232/422/485 jumper for COM2	10, 31
IDE1	Primary IDE connector	16
DVI2	DVI connector (AIMB-221F-00A1E only)	18
JFP1, 2, 3	Front panel connector	20
COM3/4/5/6	Serial port connectors for 4 serial ports	25
ATX1	20Pin ATX power connector	-
CPUFAN1	CPU fan power connector	26
SYSFAN1, 2	System fan power connector	27
LPT1	Printer port connector	28
GPIO1	8-bit GPIO header	33
FPAUD1	Front Panel Audio header	40
LAN1_USB12	RJ45 and 2 USB connector (at rear I/O)	35
LAN2_USB34		36
SPKOUT1	Speaker Out header	41
SATA 1,2,3,4	Serial-ATA port	42
INV1	Inverter header	44
LVDS1	LVDS connector	47
VGA2	TV-Out connector (AIMB-221F-00A1E only)	45
USB5, 6	USB connector	37
USB7, 8		38
VGA1	VGA connector (at rear I/O)	34
HDMI1	HDMI connector (at rear I/O)	34
Audio	Audio connector (at rear I/O), Line-In, Line-Out, MIC	39
LAN1_USB12	RJ45 and 2 USB connector (at rear I/O)	35
LAN2_USB34		36
KB_MS	PS2 Keyboard and Mice connector (ar rear I/O)	-

1.8 Safety Precautions

Warning! *Always completely disconnect the power cord from your chassis when-ever you work with the hardware. Do not make connections while the power is on. Sensitive electronic components can be damaged by sud-den power surges. Only experienced electronics personnel should open the PC chassis.*

Caution! *Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to static electric charges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis.*

Caution! *The computer is provided with a battery-powered Real-time Clock cir-cuit. There is a danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by the manu-facturer. Discard used batteries according to manufacturer's instruc-tions.*

Caution! *There is a danger of a new battery exploding if it is incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the man-ufacturer. Discard used batteries according to the manufacturer's instructions.*

1.9 Jumper Settings

This section provides instructions on how to configure your motherboard by setting the jumpers. It also includes the motherboard default settings and your options for each jumper.

1.9.1 How to set jumpers

You can configure your motherboard to match the needs of your application by set-ting the jumpers. A jumper is a metal bridge that closes an electrical circuit. It consists of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To "close" (or turn on) a jumper, you connect the pins with the clip. To "open" (or turn off) a jumper, you remove the clip. Sometimes a jumper consists of a set of three pins, labeled 1, 2, and 3. In this case you connect either pins 1 and 2, or 2 and 3. A pair of needle-nose pliers may be useful when set-ting jumpers.

1.9.2 CMOS clear (JCMOS1)

The AIMB-221 motherboard contains a jumper that can erase CMOS data and reset the system BIOS information. Normally this jumper should be set with pins 1-2 closed. If you want to reset the CMOS data, set JCMOS1 to 2-3 closed for just a few seconds, and then move the jumper back to 1-2 closed. This procedure will reset the CMOS to its default setting.

Table 1.1: CMOS (JCMOS1)	
Function	**Jumper Setting**
* Keep CMOS data	1-2 closed
Clear CMOS data	2-3 closed

* default setting

1.9.3 Watchdog timer output (JWDT1)

The AIMB-221 contains a watchdog timer that will reset the CPU or send a signal to IRQ11 in the event the CPU stops processing. This feature means the AIMB-221 will recover from a software failure or an EMI problem. The JWDT1 jumper settings control the outcome of what the computer will do in the event the watchdog timer is tripped.

Table 1.2: Watchdog timer output (JWDT1)	
Function	**Jumper Setting**
IRQE	1-2 closed
*Reset	2-3 closed
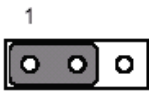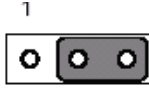
* default setting

> **Note!** The interrupt output of the watchdog timer is a low level signal. It will be held low until the watchdog timer is reset.

Table 1.3: ATX/AT mode selector (JPSON1)

Function	Jumper Setting	
AT Mode	1 ⟦ o o ⟧ o	1-2 closed
ATX Mode*	1 o ⟦ o o ⟧	2-3 closed

*Default setting

Table 1.4: COM1 RS-232 with 5V or 12V selector (JSETCOM1)

Use jumper to select the 5V or 12V mode for COM1. The default setting is RS-232 ring in.

RS-232 Ring In   RS-232 with 5 V   RS-232 with 12 V
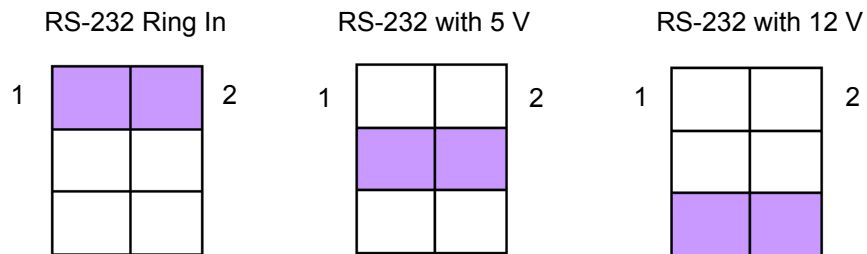
Table 1.5: COM2 RS-232/422/485 mode selector (JSETCOM2)

Use JP1 to select the RS-232/422/485 mode for COM2. The default setting is RS-232.
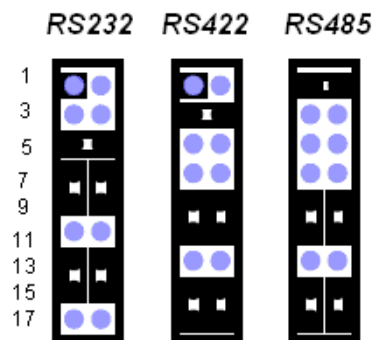
Figure 1.4 COM2 RS-232/422/485 jumper setting

1.10 System Memory

The AIMB-221 has two sockets for 200-pin dual inline memory modules (SODIMMs) in two memory channels.

All these sockets use 1.8 V unbuffered double data rate synchronous DRAMs (DDR SDRAM). They are available in capacities of 256, 512 1024 and 2048 MB. The sockets can be filled in any combination with DIMMs of any size, giving a total memory size between 256 MB and 4 GB.

1.10.1 CPU FSB and memory speed

The AIMB-221 can accept DDR2 SDRAM memory chips without parity. Also note that the AIMB-221 accepts DDR2 533/667/800 MHz SDRAM. The AIMB-221 does not support ECC (error checking and correction).

1.11 Memory Installation Procedures

To install DIMMs, first make sure the two handles of the DIMM socket are in the "open" position. i.e. The handles lean outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket, and then press the DIMM module right down into the socket, until you hear a click. This is when the two handles have automatically locked the memory module into the correct position of the DIMM socket. To remove the memory module, just push both handles outward, and the memory module will be ejected by the mechanism in the socket.

1.12 Cache Memory

The AIMB-221 supports a CPU with one of the following built-in full-speed L2 caches:

■   1 MB for AMD Turion 64X2 TL-62 and TL56 CPUs,
■   512 KB for Mobile AMD Sempron 3700 + CPUs, and
■   256 KB for Mobile AMD Sempron 2100 + CPUs.

The built-in second-level cache in the processor yields much higher performance than conventional external cache memories.

1.13 Processor Installation

Warning! *Without a fan or heat sink, the CPU will overheat and cause damage to both the CPU and the single board computer. To install a CPU, first turn off your system.*

The AIMB-221 is designed for AMD Mobile AMD Turion^{TM} and Mobile AMD Sempron^{TM} (Socket S1g1) up to 2.1 GHz. Follow these steps to install the processor:

1.   Turn the screw to loosen the processor socket.
2.   Align the triangular marking on the processor with the small arrow on the corner of the socket.
3.   Turn the screw to its original position.
4.   Install the heat sink on the CPU. The concave part of the heat sink should face the capacitors to avoid contact with the capacitors.

1.14 PCI Bus Routing Table

Table 1.6: PCI Bus Routing Table

PCI Slot	ID SEL	PCI Interrupt
PCI1	AD31	INT B, C, D, A
Mini PCI1	AD28	INT C, D, A, B

Table 1.7: PCI1 (Routing: AD31 / PCI_#INTF, #INTG, #INTH, #INTE)

pin.A1	NC	pin.B1	-VCC12
pin.A2	VCC12	pin.B2	NC
pin.A3	NC	pin.B3	NC
pin.A4	NC	pin.B4	NC
pin.A5	VCC	pin.B5	VCC
pin.A6	PCI_#INTF	pin.B6	VCC
pin.A7	PCI_#INTH	pin.B7	PCI_#INTG
pin.A8	VCC	pin.B8	PCI_#INTE
pin.A9	(rev) PCI_#GNT1	pin.B9	(rev) CLK_33M_PCI1
pin.A10	VCC	pin.B10	(rev) PCI_#REQ1
pin.A11	(rev) PCI_#GNT2	pin.B11	(rev) CLK_33M_PCI2
pin.A12	GND	pin.B12	GND
pin.A13	GND	pin.B13	GND
pin.A14	VCC3 STANBY	pin.B14	(rev) PCI_#REQ2
pin.A15	PCI_#RST	pin.B15	GND
pin.A16	VCC	pin.B16	CLK_33M_PCI0
pin.A17	PCI_#GNT0	pin.B17	GND
pin.A18	GND	pin.B18	PCI_#REQ0
pin.A19	PCI_#PME	pin.B19	VCC
pin.A20	PCI_AD30	pin.B20	PCI_AD31
pin.A21	VCC3	pin.B21	PCI_AD29
pin.A22	PCI_AD28	pin.B22	GND
pin.A23	PCI_AD26	pin.B23	PCI_AD27
pin.A24	GND	pin.B24	PCI_AD25
pin.A25	PCI_AD24	pin.B25	VCC3
pin.A26	PCI_IDSEL(AD31)	pin.B26	PCI_#C/BE3
pin.A27	VCC3	pin.B27	PCI_AD23
pin.A28	PCI_AD22	pin.B28	GND
pin.A29	PCI_AD20	pin.B29	PCI_AD21
pin.A30	GND	pin.B30	PCI_AD19
pin.A31	PCI_AD18	pin.B31	VCC3
pin.A32	PCI_AD16	pin.B32	PCI_AD17
pin.A33	VCC3	pin.B33	PCI_#C/BE2
pin.A34	PCI_#FRAME	pin.B34	GND
pin.A35	GND	pin.B35	PCI_#IRDY
pin.A36	PCI_#TRDY	pin.B36	VCC3
pin.A37	GND	pin.B37	PCI_#DEVSEL
pin.A38	PCI_#STOP	pin.B38	GND

Table 1.7: PCI1 (Routing: AD31 / PCI_#INTF, #INTG, #INTH, #INTE)

pin.A39	VCC3	pin.B39	PCI_#LOCK
pin.A40	NC	pin.B40	PCI_#PERR
pin.A41	NC	pin.B41	VCC3
pin.A42	GND	pin.B42	PCI_#SERR
pin.A43	PCI_PAR	pin.B43	VCC3
pin.A44	PCI_AD15	pin.B44	PCI_#C/BE1
pin.A45	VCC3	pin.B45	PCI_AD14
pin.A46	PCI_AD13	pin.B46	GND
pin.A47	PCI_AD11	pin.B47	PCI_AD12
pin.A48	GND	pin.B48	PCI_AD10
pin.A49	PCI_AD9	pin.B49	GND
KEY (5V-IO) -	KEY (5V-IO) -		
KEY (5V-IO) -	KEY (5V-IO) -		
pin.A52	PCI_#C/BE0	pin.B52	PCI_AD8
pin.A53	VCC3	pin.B53	PCI_AD7
pin.A54	PCI_AD6	pin.B54	VCC
pin.A55	PCI_AD4	pin.B55	PCI_AD5
pin.A56	GND	pin.B56	PCI_AD3
pin.A57	PCI_AD2	pin.B57	GND
pin.A58	PCI_AD0	pin.B58	PCI_AD1
pin.A59	VCC	pin.B59	VCC
pin.A60	PU_#REQ64	pin.B60	PU_#ACK64
pin.A61	VCC	pin.B61	VCC
pin.A62	VCC	pin.B62	VCC

Table 1.8: MINIPCI1 (Routing: AD28 / #INTE / #INTF)

pin.1	NC	pin.2	NC
pin.3	NC	pin.4	NC
pin.5	NC	pin.6	NC
pin.7	NC	pin.8	NC
pin.9	NC	pin.10	NC
pin.11	NC	pin.12	NC
pin.13	NC	pin.14	NC
pin.15	NC	pin.16	NC
pin.17	PCI_#INTF	pin.18	VCC
pin.19	VCC3	pin.20	PCI_#INTE
pin.21	NC	pin.22	NC
pin.23	GND	pin.24	VCC3 Standby
pin.25	CLK_33M_PCI3	pin.26	PCI_#RST
pin.27	GND	pin.28	VCC3
pin.29	PCI_#REQ3	pin.30	PCI_#GNT3
pin.31	VCC3	pin.32	GND
pin.33	PCI_AD31	pin.34	PCI_#PME
pin.35	PCI_AD29	pin.36	NC
pin.37	GND	pin.38	PCI_AD30
pin.39	PCI_AD27	pin.40	VCC3

Table 1.8: MINIPCI1 (Routing: AD28 / #INTE / #INTF)			
pin.41	PCI_AD25	pin.42	PCI_AD28
pin.43	NC	pin.44	PCI_AD26
pin.45	PCI_#C/BE3	pin.46	PCI_AD24
pin.47	PCI_AD23	pin.48	PCI_#IDSEL(AD28)
pin.49	GND	pin.50	GND
pin.51	PCI_AD21	pin.52	PCI_AD22
pin.53	PCI_AD19	pin.54	PCI_AD20
pin.55	GND	pin.56	PCI_PAR
pin.57	PCI_AD17	pin.58	PCI_AD18
pin.59	PCI_#C/BE2	pin.60	PCI_AD16
pin.61	PCI_#IRDY	pin.62	GND
pin.63	VCC3	pin.64	PCI_#FRAME
pin.65	PD_#CLKRUN	pin.66	PCI_#TRDY
pin.67	PCI_#SERR	pin.68	PCI_#STOP
pin.69	GND	pin.70	VCC3
pin.71	PCI_#PERR	pin.72	PCI_#DEVSEL
pin.73	PCI_#C/BE1	pin.74	GND
pin.75	PCI_AD14	pin.76	PCI_AD15
pin.77	GND	pin.78	PCI_AD13
pin.79	PCI_AD12	pin.80	PCI_AD11
pin.81	PCI_AD10	pin.82	GND
pin.83	GND	pin.84	PCI_AD9
pin.85	PCI_AD8	pin.86	PCI_#C/BE0
pin.87	PCI_AD7	pin.88	VCC3
pin.89	GND	pin.90	PCI_AD6
pin.91	PCI_AD5	pin.92	PCI_AD4
pin.93	NC	pin.94	PCI_AD2
pin.95	PCI_AD3	pin.96	PCI_AD0
pin.97	VCC	pin.98	NC
pin.99	PCI_AD1	pin.100	NC
pin.101	GND	pin.102	GND
pin.103	NC	pin.104	PCI_M66EN (PD)
pin.105	NC	pin.106	NC
pin.107	NC	pin.108	NC
pin.109	NC	pin.110	NC
pin.111	NC	pin.112	NC
pin.113	GND	pin.114	GND
pin.115	NC	pin.116	NC
pin.117	NC	pin.118	NC
pin.119	NC	pin.120	NC
pin.121	NC	pin.122	NC
pin.123	NC	pin.124	VCC3 Standby

Chapter 2

Connecting Peripherals

2.1 Introduction

You can access most of the connectors from the top of the board as it is being installed in the chassis. If you have a number of cards installed, you may need to partially remove a card to make all the connections.

2.2 Primary (IDE1) IDE Connector
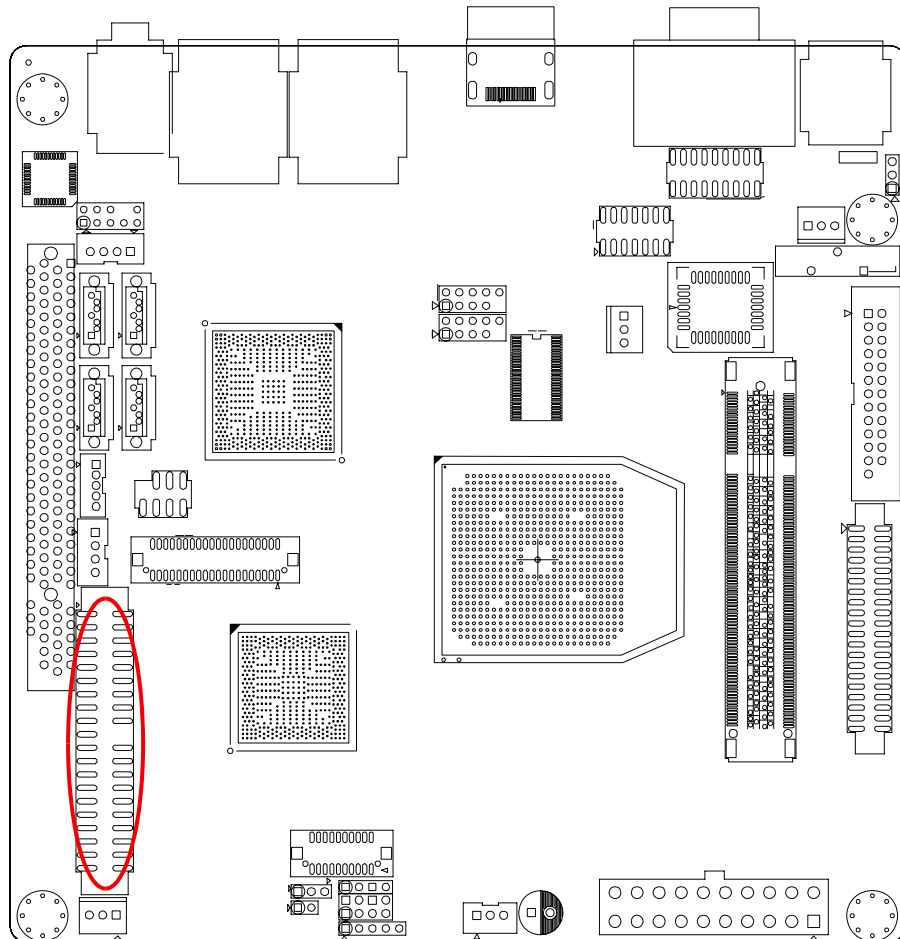
You can attach up to one IDE (Integrated Drive Electronics) drive to the AIMB-221's built-in controller.

Wire number 1 on the cable is red or blue and the other wires are gray. Connect one end to connector IDE1 on the motherboard. Make sure that the red/blue wire corresponds to pin 1 on the connector (in the upper right hand corner).

Connect the hard drive to the other end of the cable. Wire 1 on the cable should also connect to pin 1 on the hard drive connector, which is labeled on the drive circuit board. Check the documentation that came with the drive for more information.

IDE1			
pin.1	#IDE_RST	pin.2	GND
pin.3	IDE_D7	pin.4	IDE_D8
pin.5	IDE_D6	pin.6	IDE_D9
pin.7	IDE_D5	pin.8	IDE_D10
pin.9	IDE_D4	pin.10	IDE_D11
pin.11	IDE_D3	pin.12	IDE_D12
pin.13	IDE_D2	pin.14	IDE_D13
pin.15	IDE_D1	pin.16	IDE_D14
pin.17	IDE_D0	pin.18	IDE_D15
pin.19	GND KEY		
pin.21	IDE_DREQ	pin.22	GND
pin.23	IDE_#DIOW	pin.24	GND
pin.25	IDE_#DIOR	pin.26	GND
pin.27	IDE_IORDY	pin.28	GND
pin.29	IDE_#DACK	pin.30	GND
pin.31	IDE_IRQ	pin.32	NC
pin.33	IDE_DA1	pin.34	IDE_#P66DET
pin.35	IDE_DA0	pin.36	IDE_DA2
pin.37	IDE_#CS1	pin.38	IDE_#CS3
pin.39	IDE_#ACT	pin.40	GND

2.3 DVI2 (Optional)
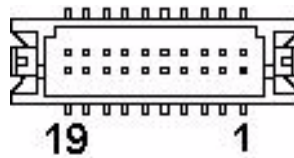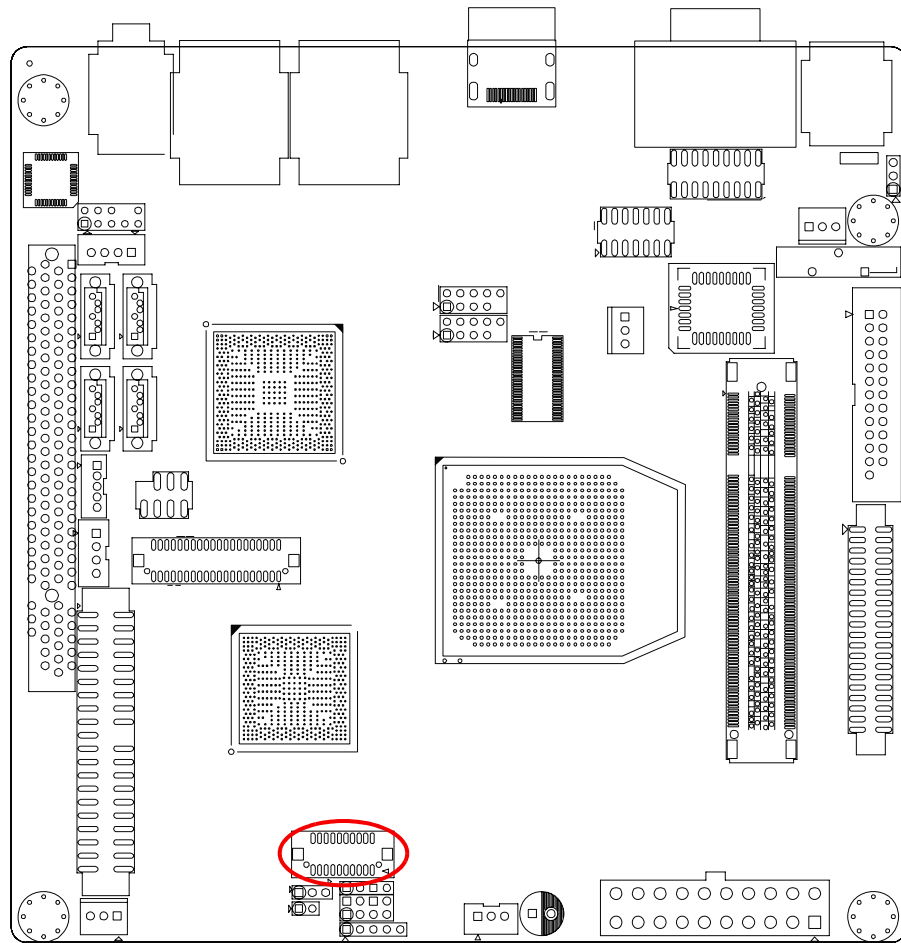
Signal	PIN	PIN	Signal
VCC	2	1	DVI2_Tx0-
DVI2_TxC-	4	3	DVI2_Tx0+
DVI2_TxC+	6	5	GND
GND	8	7	DVI2_Tx1-
DVI2_DDCCLK	10	9	DVI2_Tx1+
DVI2_DDCAT	12	11	GND
PLUG_Detect	14	13	DVI2_Tx2-
NC	16	15	DVI2_Tx2+
NC	18	17	VCC
NC	20	19	NC

The TFP410 is a DVI-compliant digital transmitter that is used in digital host monitor systems to T.M.D.S. encode and serialize RGB pixel data streams. TFP410 supports resolutions from VGA to UXGA and can be controlled in two ways:

1. Configuration and state pins or
2. The programmable I2C serial interface (see the terminal functions section).

The host in a digital display system, usually a PC or consumer electronics device, contains a DVI-compatible transmitter such as the TI TFP410 that receives 24-bit pixel data along with appropriate control signals. The TFP410 encodes the signals into a high speed, low voltage, differential serial bit stream optimized for transmission over a twisted-pair cable to a display device. The display device, usually a flat-panel monitor, requires a DVI compatible receiver like the TI TFP401 to decode the serial bit stream back to the same 24-bit pixel data and control signals that originated at the host. This decoded data can then be applied directly to the flat panel drive circuitry to produce an image on the display. Since the host and display can be separated by distances up to 5 meters or more, serial transmission of the pixel data is preferred (see the T.M.D.S. pixel data and control signal encoding, pixel data and control signal encoding, universal graphics control interface voltage signal levels, and universal graphics controller interface clock inputs sections).

The TFP410 integrates a high-speed digital interface, a T.M.D.S. encoder, and three differential T.M.D.S. drivers. Data is driven to the TFP410 encoder across 12 or 24 data lines, along with differential clock pair and sync signals. The flexibility of the TFP410 allows for multiple clock and data formats that enhance system performance.

The TFP410 also has enhanced PLL noise immunity, an enhancement accomplished with on-chip regulators and bypass capacitors.

The TFP410 is versatile and highly programmable to provide maximum flexibility for the user. An I2C host interface is provided to allow enhanced configurations in addition to power-on default settings programmed by pin-strapping resistors.

2.4 Front Panel Connectors (JFP1, JFP2, JFP3)
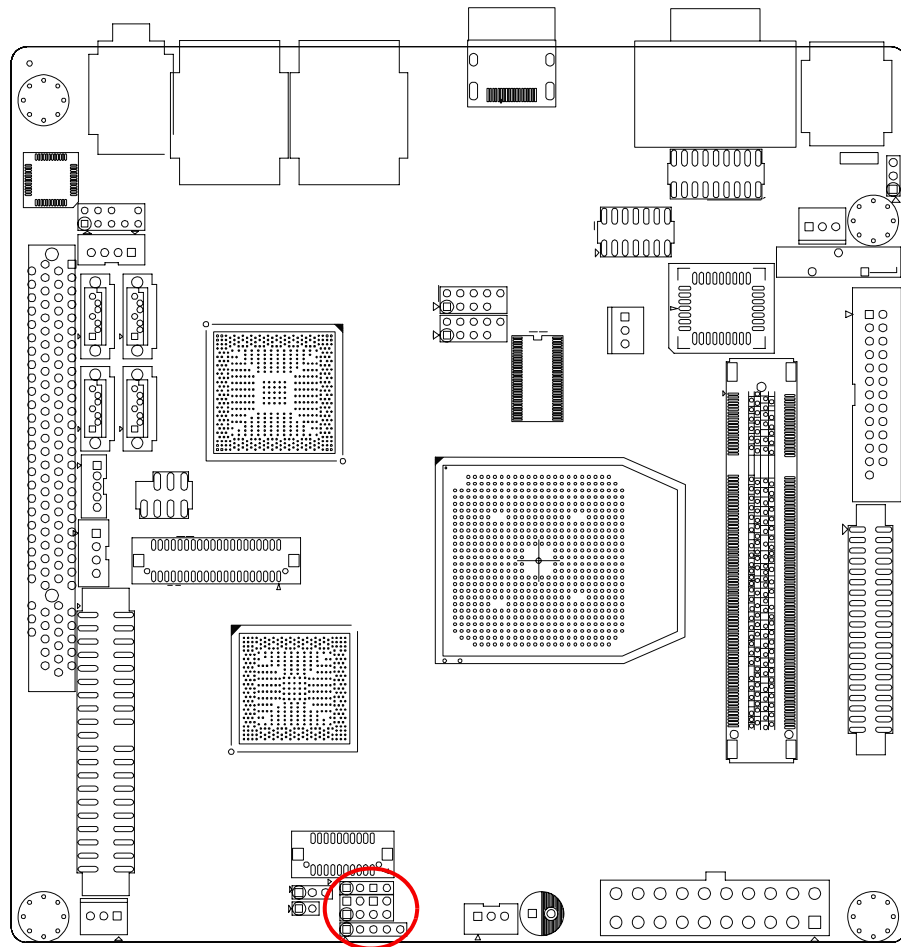
1	2	3	4		JFP1
1	3	5	7		JFP2
2	4	6	8		
1	2	3	4	5	JFP3
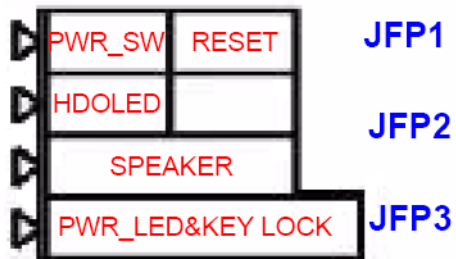
2.4.1 ATX Soft Power Switch (JFP1)

If your computer case is equipped with an ATX power supply, you should connect the power on/off button on your computer case to JFP1 PIN1, 2. This connection enables you to turn your computer on and off.

1	2	3	4	JFP1
1	3	5	7	
2	4	6	8	
1	2	3	4	5
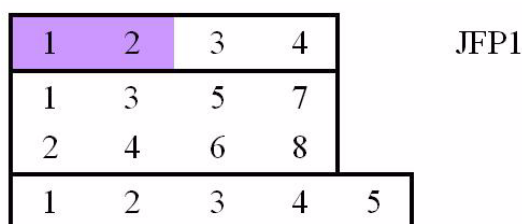
2.4.2 Reset Connector (JFP1)

Many computer cases offer the convenience of a reset button. Connect the wire from the reset button.

1	2	3	4	JFP1
1	3	5	7	
2	4	6	8	
1	2	3	4	5
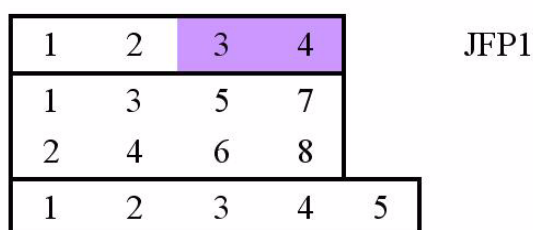
JFP1

pin.1	#PWR_SW
pin.2	GND
pin.3	#RST_SW
pin.4	GND

2.4.3 External Speaker (JFP2)

JFP2 is a 4-pin connector for an external speaker. If there is no external speaker, the AIMB-221 provides an onboard buzzer as an alternative. To enable the buzzer, set pins 5-7 as closed.

1	2	3	4	JFP2
1	3	5	7	
2	4	6	8	
1	2	3	4	5
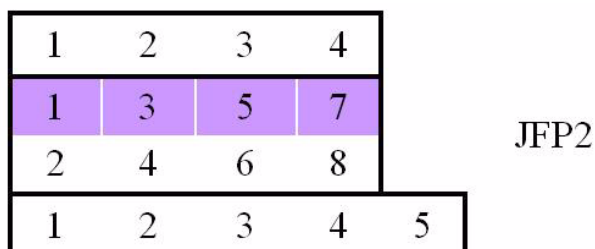
2.4.4 HDD LED Connector (JFP2)

You can connect an LED to connector JFP2 to indicate when the HDD is active.
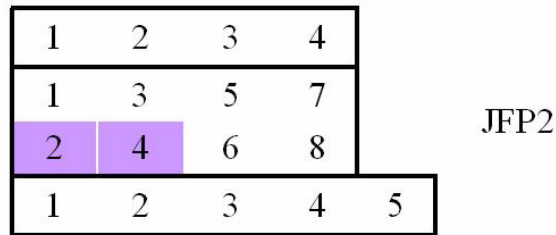
2.4.5 SM Bus Connector (JFP2 PIN6,8)

This connector is reserved for Advantech's SNMP-1000 HTTP/SNMP Remote System Manager. The SNMP-1000 allows users to monitor the internal voltages, temperature and fans from a remote computer through an Ethernet network.

JFP2 PIN6,8 can be connected to CN19 of SNMP-1000. Please be careful about the pin assignments, pin 6 must be connected to pin 1 and pin 8 to pin 2 on both ends of cable.
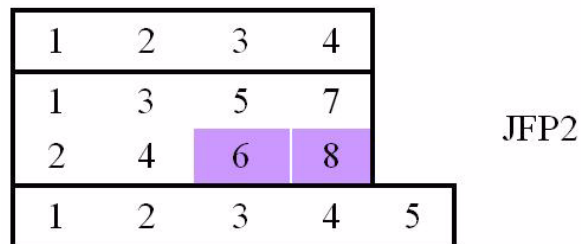
JFP2

pin.1	BUZZER+	pin.2	HDD_LED+
pin.3	NC	pin.4	HDD_LED-
pin.5	MB_BEEP+	pin.6	SM_DAT
pin.7	BUZZER-	pin.8	SM_CLK

2.4.6 Power LED and keyboard lock connector (JFP3 / PWR_LED&KEY LOCK)

(JFP3 / PWR_LED&KEY LOCK) is a 5-pin connector for the power on LED and Key Lock function. The Power LED cable should be connected to pin 1-3. The key lock button cable should be connected to pin 4-5.

There are 3 modes for the power supply connection. The first is "ATX power mode", system is on/off by a tentative power button. The second is "AT Power Mode", system is on/off by the switch of the Power supply. The third is another "AT Power Mode" which is using the front panel power switch. The power LED status is indicated as following table:

Table 2.1: ATX power supply LED status (No support for AT power)			
Power Mode	**LED (ATX Power Mode) (On/Off by tentative button)**	**LED (AT Power Mode) (On/Off by switching power supply)**	**LED (AT Power Mode) (On/Off by front panel switch)**
PSON1 (On Back plane) Jumper Setting	2-3 pin closed	1-2 pin closed	Connect 1-2 pin cable with switch
System On	On	On	On
System Status	Fast flashes	Fast flashes	Fast flashes
System Off	Slow flashes	Off	Off
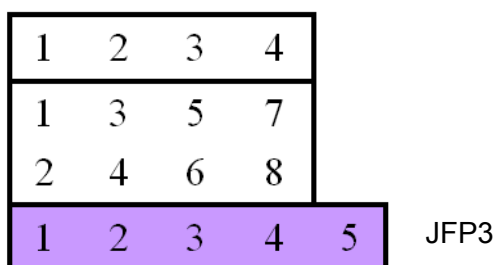
JFP3

JFP3	
pin.1	PWR_LED+
pin.2	NC
pin.3	GND
pin.4	#KB_LOCK
pin.5	GND

2.5 ATX/AT Mode Selector (JPSON1)
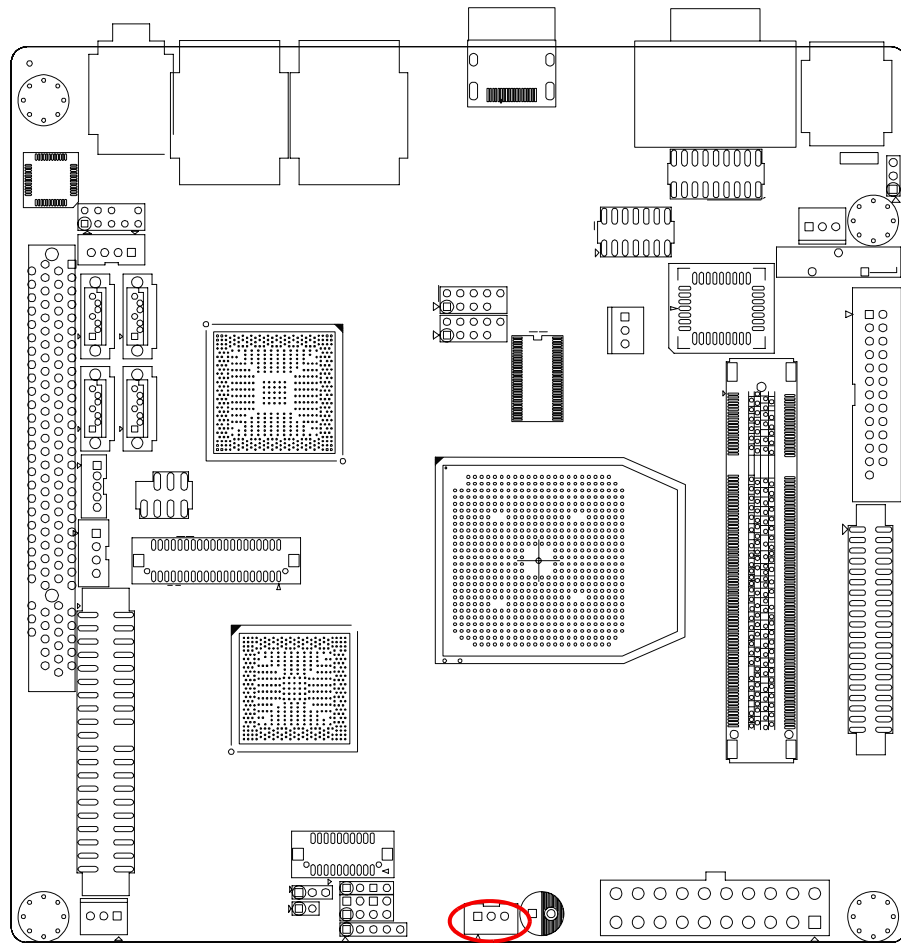
Table 2.2: ATX/AT Mode selector (PSON1)

Function	Jumper Setting	
AT Mode	1	1-2 closed
ATX Mode	1	2-3 closed

JPSON1	
pin.1	ATX mode
pin.2	PS_SELECT
pin.3	AT mode

2.6 Serial Port Header (COM 3/4/5/6)
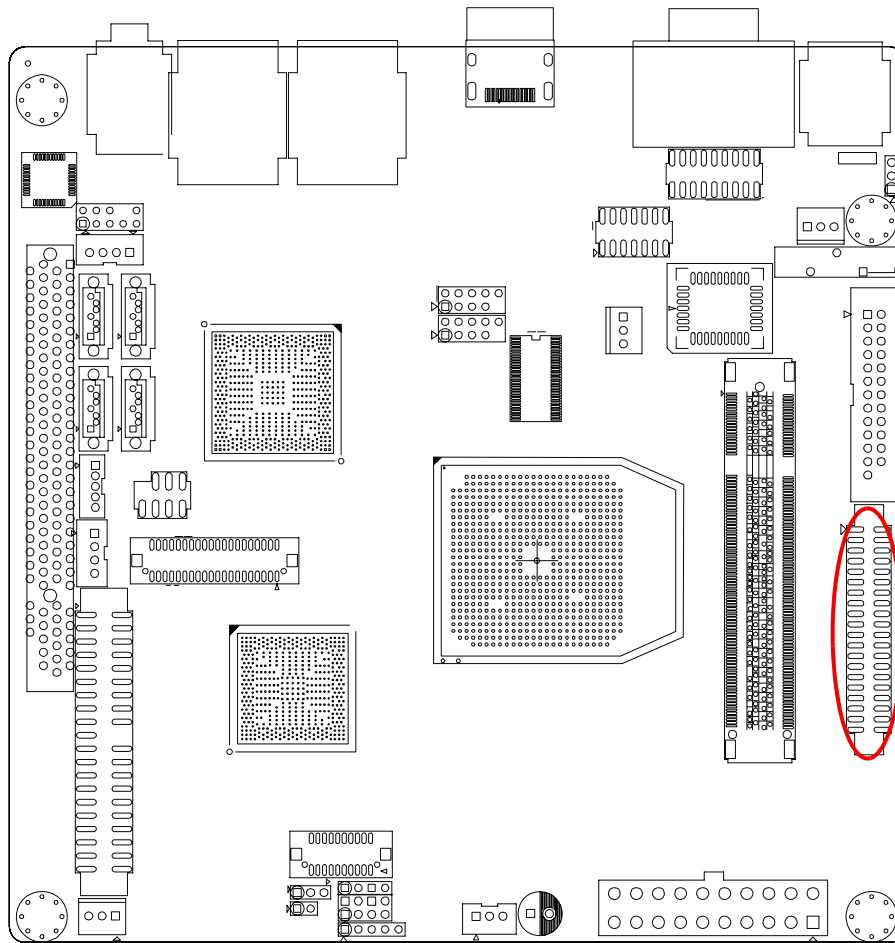
Com #	Define	Pin		Pin	Define	Com #
	COM3_#DCD	1		2	COM3_#DSR	
	COM3_SIN	3		4	COM3_#RTS	
COM3	COM3_SOUT	5		6	COM3_#CTS	COM3
	COM3_#DTR	7		8	COM3_#RI	
	GND	9		10	NC	
	COM4_#DCD	11		12	COM4_#DSR	
	COM4_SIN	13		14	COM4_#RTS	
COM4	COM4_SOUT	15		16	COM4_#CTS	COM4
	COM4_#DTR	17		18	COM4_#RI	
	GND	19		20	NC	
	COM5_#DCD	21		22	COM5_#DSR	
	COM5_SIN	23		24	COM5_#RTS	
COM5	COM5_SOUT	25		26	COM5_#CTS	COM5
	COM5_#DTR	27		28	COM5_#RI	
	GND	29		30	NC	
	COM6_#DCD	31		32	COM6_#DSR	
	COM6_SIN	33		34	COM6_#RTS	
COM6	COM6_SOUT	35		36	COM6_#CTS	COM6
	COM6_#DTR	37		38	COM6_#RI	
	GND	39		40	NC	

2.7 CPU Fan Connector (CPU Fan1)
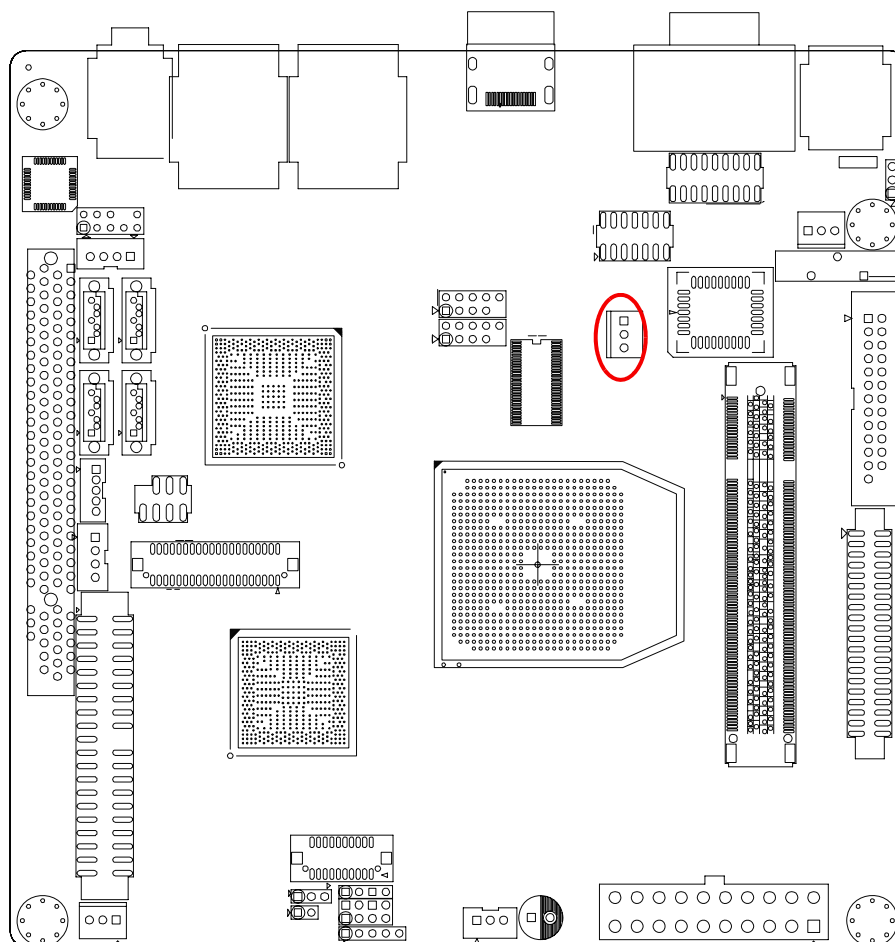
CPUFAN1	
pin.1	GND
pin.2	VCC12
pin.3	SPEED

2.8 System Fan (SYSFAN1, SYSFAN2)
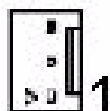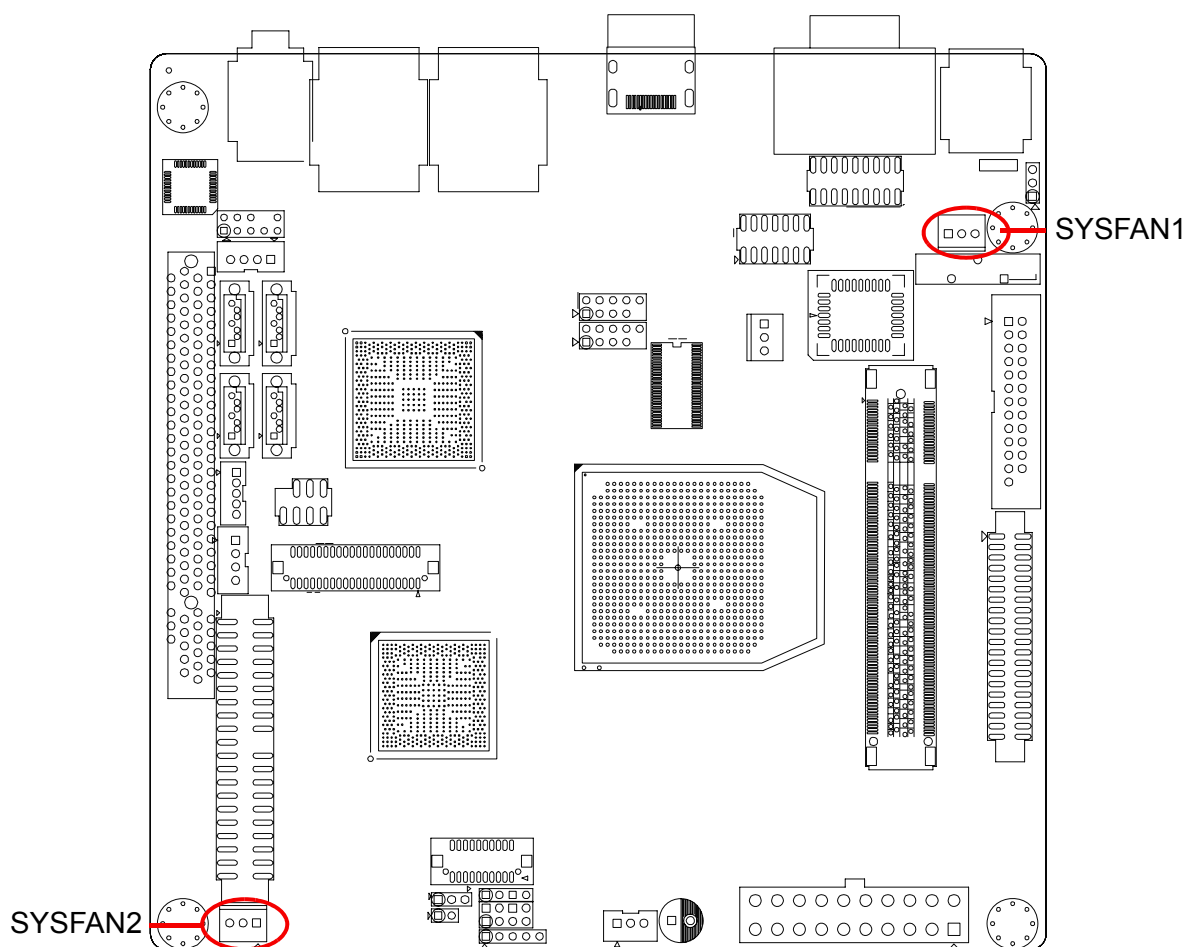
SYSFAN1

SYSFAN2

SYSFAN1

pin.1	GND
pin.2	VCC12
pin.3	SPEED
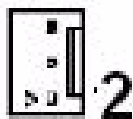
SYSFAN2

pin.1	GND
pin.2	VCC12
pin.3	NC

Note! *Super IO W83627UHG support 2 sets of Fan Monitoring only. When all the CPU fan, Sysfan 1, and Sysfan 2 are plugged, there will only show CPU fan and Sysfan 1 in the BIOS.*

2.9 Parallel Port (LPT1)
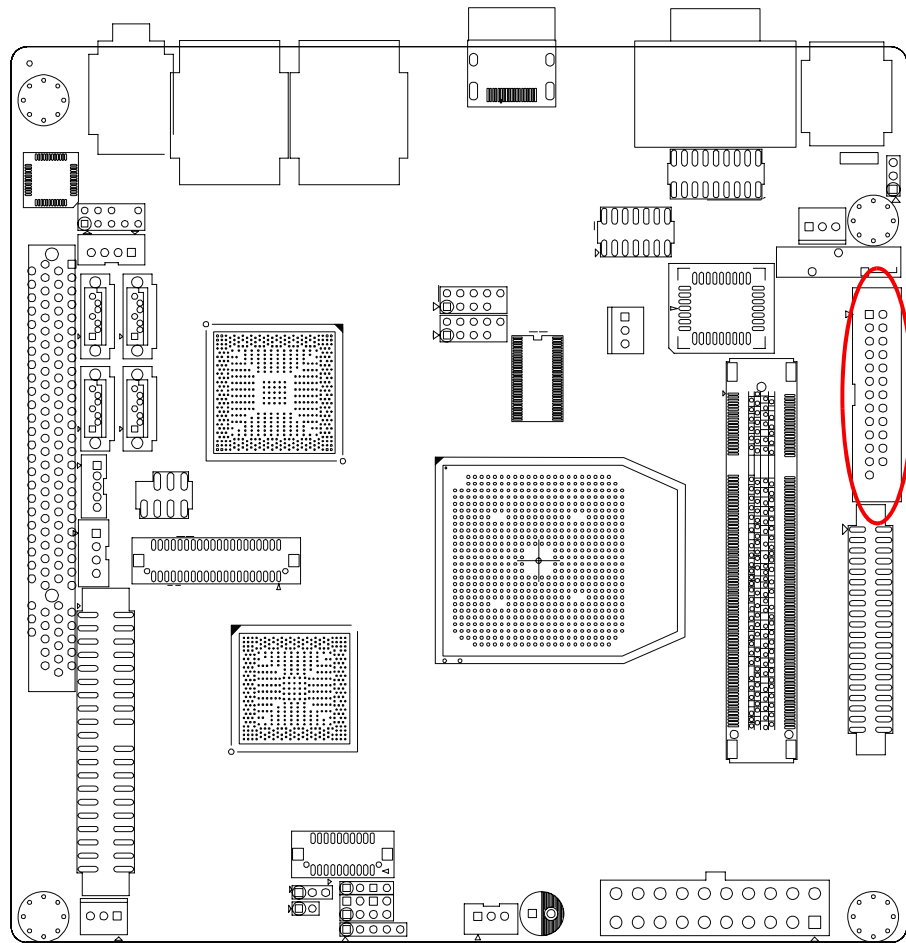
LPT1

pin.1	LTP1_#STBB	pin.2	LTP1_#AFD
pin.3	LTP1_PD0B	pin.4	LTP1_#ERR
pin.5	LTP1_PD1B	pin.6	LTP1_#INIT
pin.7	LTP1_PD2B	pin.8	LTP1_#SLIN
pin.9	LTP1_PD3B	pin.10	GND
pin.11	LTP1_PD4B	pin.12	GND
pin.13	LTP1_PD5B	pin.14	GND
pin.15	LTP1_PD6B	pin.16	GND
pin.17	LTP1_PD7B	pin.18	GND
pin.19	LTP1_#ACK	pin.20	GND
pin.21	LTP1_BUSY	pin.22	GND
pin.23	LTP1_PE	pin.24	GND
pin.25	LTP1_SLC	KEY	-

The mainboard provides a 26-pin header for connection to an optional parallel port bracket. The parallel port is a standard printer port that supports Enhanced Parallel Port (EPP) and Extended Capabilities Parallel Port (ECP) mode.

2.10 JSETCOM1
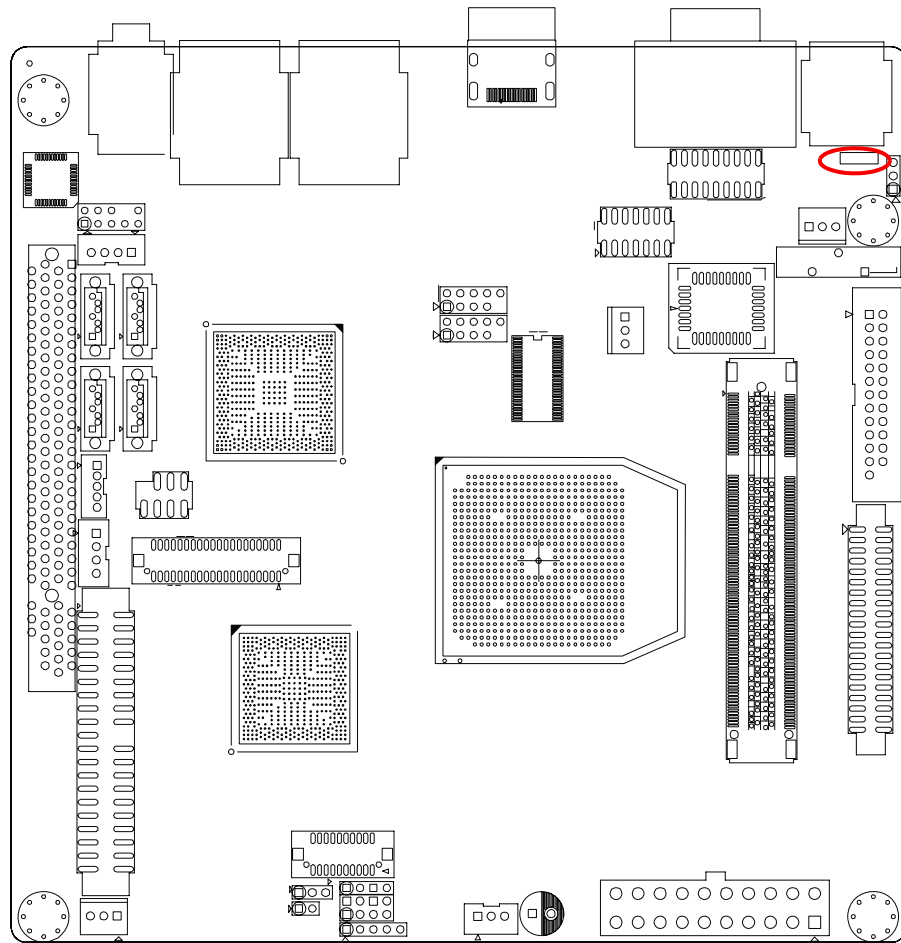
JSETCOM1

pin.1	COM1_#RI	pin.2	
pin.3	VCC	pin.4	COM1_#RI
pin.5	VCC12	pin.6	

2.11 JSETCOM2
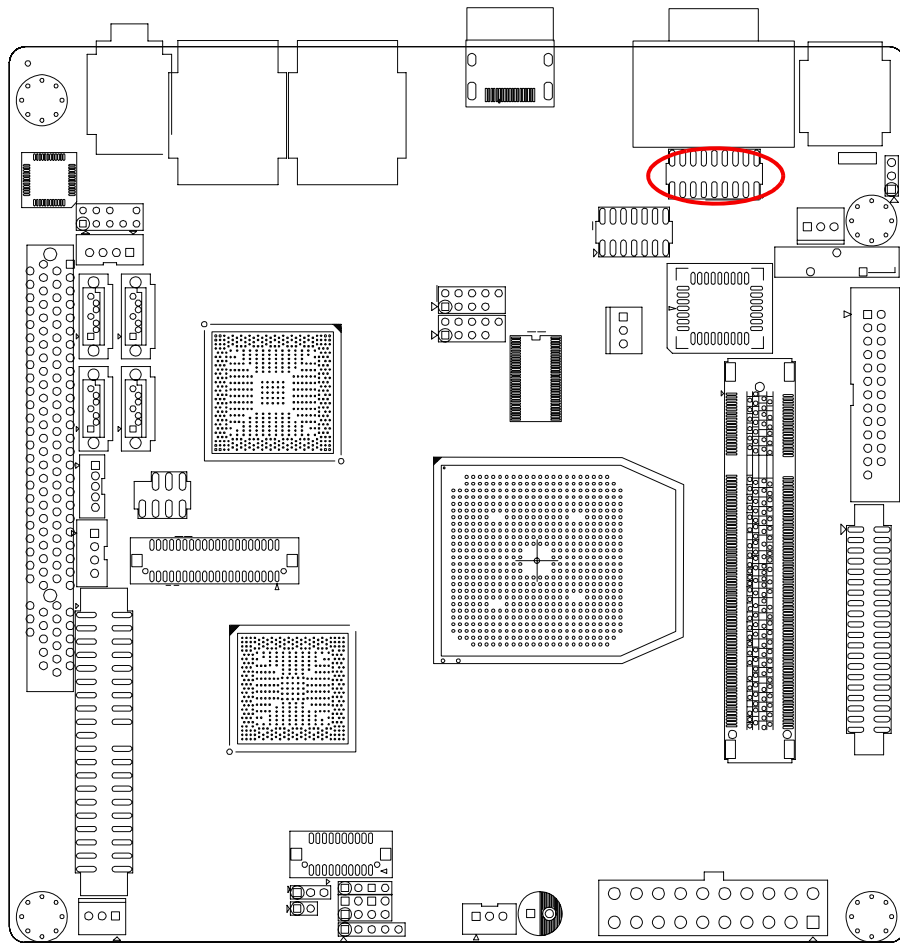
JSETCOM2			
pin.1	COM2_SIN	pin.2	UART2_RXD485
pin.3		pin.4	UART2_RXD422
pin.5		pin.6	UART2_RXD232
pin.7	COM2_#DCD	pin.8	COM2_SOUT
pin.9	COM2_PIN1	pin.10	COM2_PIN3
pin.11	COM2_TXD485N	pin.12	COM2_RXD485P
pin.13	UART2_SIN	pin.14	COM2_#DTR
pin.15	COM2_PIN2	pin.16	COM2_PIN4
pin.17	COM2_TXD485P	pin.18	COM2_RXD485N
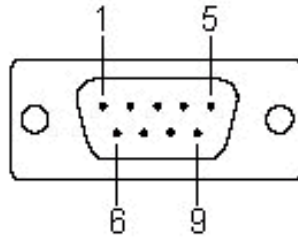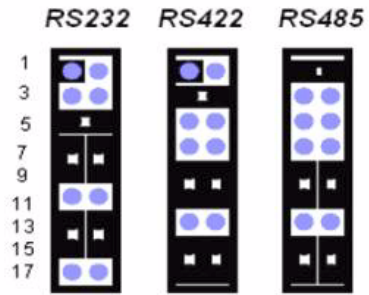
RS-422

pin.1	RS-485+	pin.2	RS-485-

RS-485

pin.1	RS-422 Tx-	pin.2	RS-422 Tx+
pin.3	RS-422 Rx+	pin.4	RS-422 Rx-

2.12 GPIO1
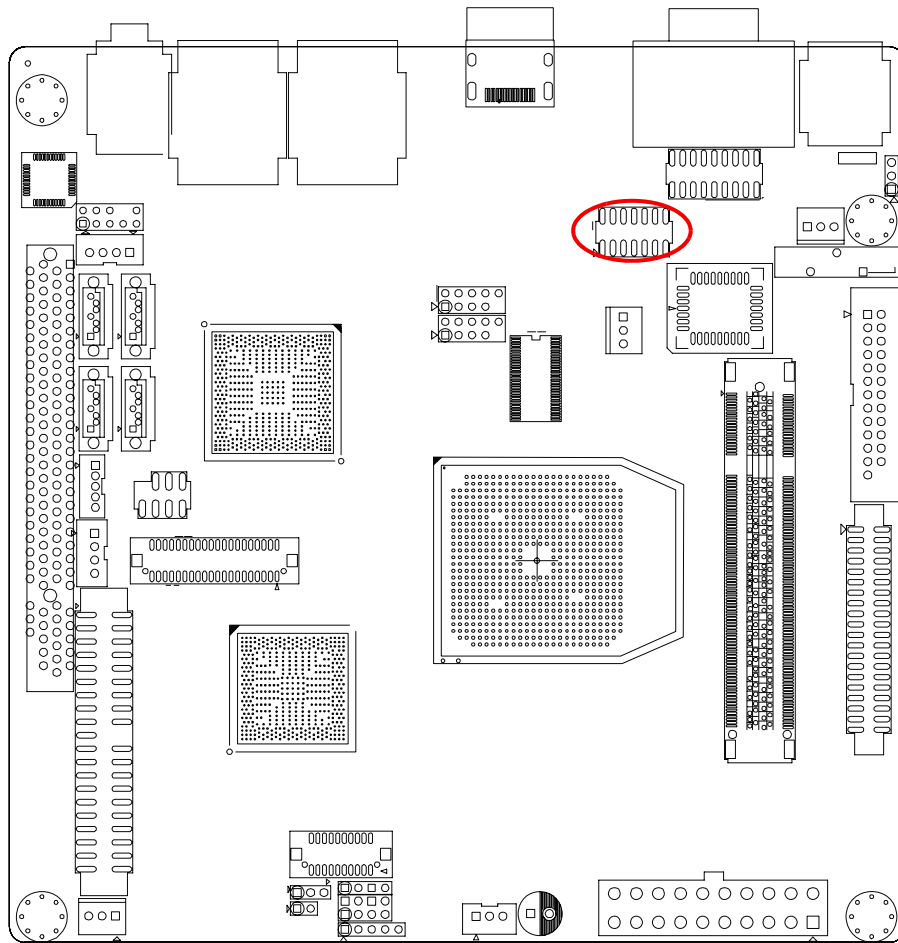
GPIO1

pin.1	GPIO_24	pin.2	GPIO_60
pin.3	VCC	pin.4	GND
pin.5	GPIO_25	pin.6	GPIO_61
pin.7	GND	pin.8	GND
pin.9	GPIO_26	pin.10	GPIO_62
pin.11	GND	pin.12	GND
pin.13	GPIO_27	pin.14	GPIO_63

General Purpose Input/Output (GPIO) is used in embedded electronics field. GPIO devices provide a set of IO ports that can be configured for either input or output, compounded by the resemblance to GP1 and GP0. The GPIO peripheral provides dedicated general-purpose pins that can be configured as either inputs or outputs. When configured as an output, you can write to an internal register to control the state driven on the output pin. When configured as an input, you can detect the state of the input by reading the state of an internal register.

In addition, the GPIO peripheral can produce CPU interrupts and enhanced Direct Memory Access (EDMA) events in different interrupt/event generation modes.

For more GPIO porting and sample code, please refer to the Appendix A.

2.13 VGA HDMI
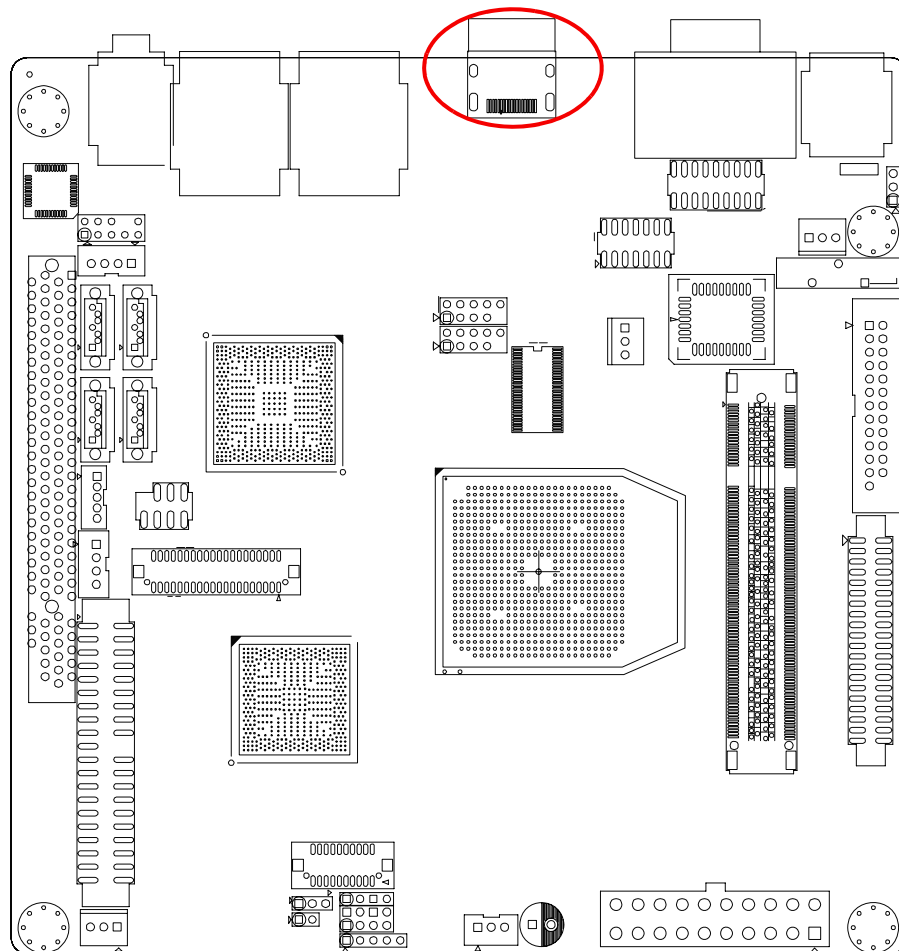
HDMI1		VGA1	
pin.1	HDMI_P2	pin.1	RED
pin.2	GND	pin.2	GREEN
pin.3	HDMI_N2	pin.3	BLUE
pin.4	HDMI_P1	pin.4	NC
pin.5	GND	pin.5	GND
pin.6	HDMI_N1	pin.6	GND
pin.7	HDMI_P0	pin.7	GND
pin.8	GND	pin.8	GND
pin.9	HDMI_N0	pin.9	VCC
pin.10	HDMI_PCLK	pin.10	GND
pin.11	GND	pin.11	NC
pin.12	HDMI_NCLK	pin.12	DDC_DAT
pin.13	NC	pin.13	Hsync
pin.14	NC	pin.14	Vsync
pin.15	GFX_DDCCLK	pin.15	DDC_CLK
pin.16	GFX_DDCDAT		
pin.17	GND		
pin.18	VCC		
pin.19	PLUG_Detect		

2.14 LAN1_USB12
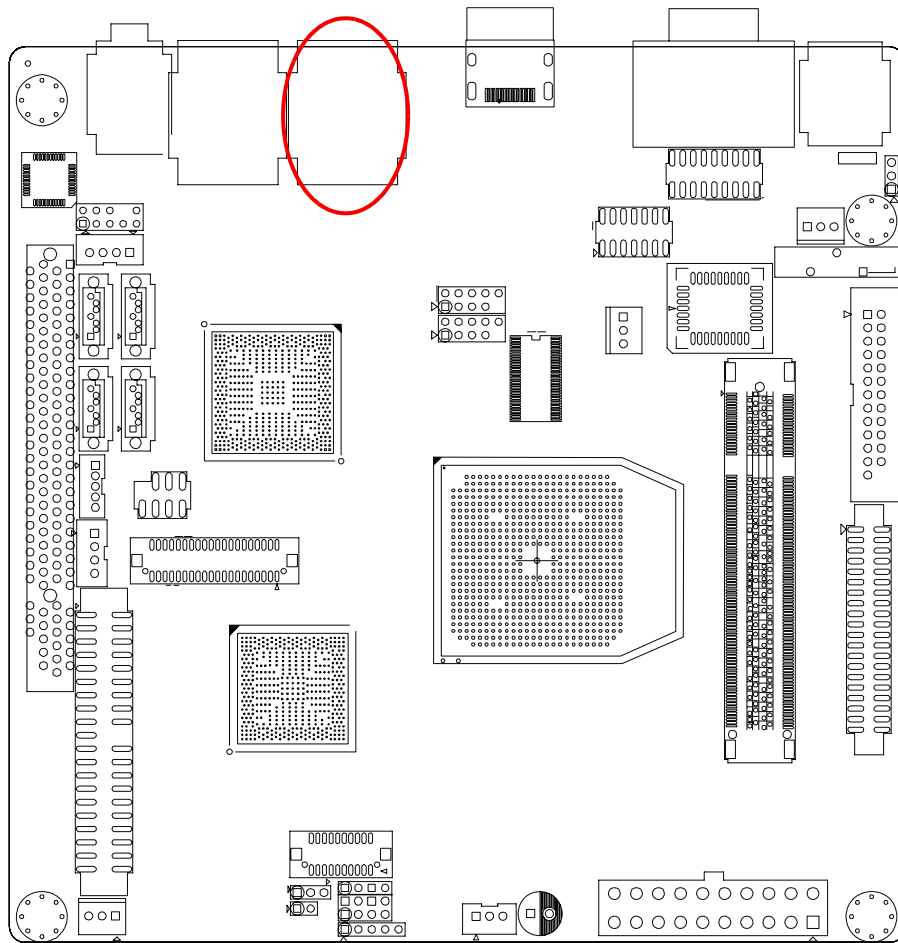
LAN1_USB12

pin.1	NC	pin.2	LAN2_MDIP0
pin.3	LAN2_MDIN0	pin.4	LAN2_MDIP2
pin.5	LAN2_MDIN2	pin.6	LAN2_MDIP2
pin.7	LAN2_MDIN2	pin.8	LAN2_MDIP3
pin.9	LAN2_MDIN3	pin.10	GND
pin.11	LAN2_ACTLED-	pin.12	LAN2_ACTLED+
pin.13	LAN2_LINKLED-	pin.14	LAN2_LINKLED+
pin.15	VCC	pin.16	USB_N2
pin.17	USB_P2	pin.18	GND
pin.19	VCC	pin.20	USB_N3
pin.21	USB_P3	pin.22	GND

2.15 LAN2_USB34
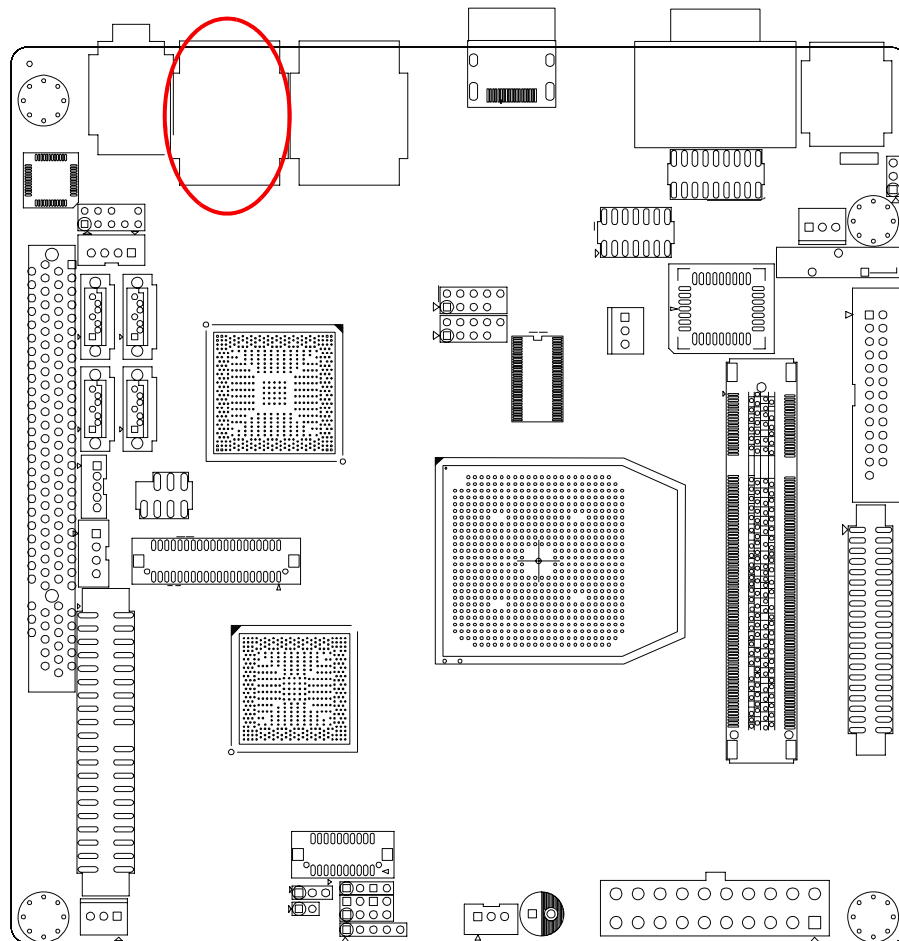
LAN2_USB34

pin.1	NC	pin.2	LAN1_MDIP0
pin.3	LAN1_MDIN0	pin.4	LAN1_MDIP1
pin.5	LAN1_MDIN1	pin.6	LAN1_MDIP2
pin.7	LAN1_MDIN2	pin.8	LAN1_MDIP3
pin.9	LAN1_MDIN3	pin.10	GND
pin.11	LAN1_ACTLED-	pin.12	LAN1_ACTLED+
pin.13	LAN1_LINKLED-	pin.14	LAN1_LINKLED+
pin.15	VCC	pin.16	USB_N1
pin.17	USB_P1	pin.18	GND
pin.19	VCC	pin.20	USB_N0
pin.21	USB_P0	pin.22	GND

2.16 USB56
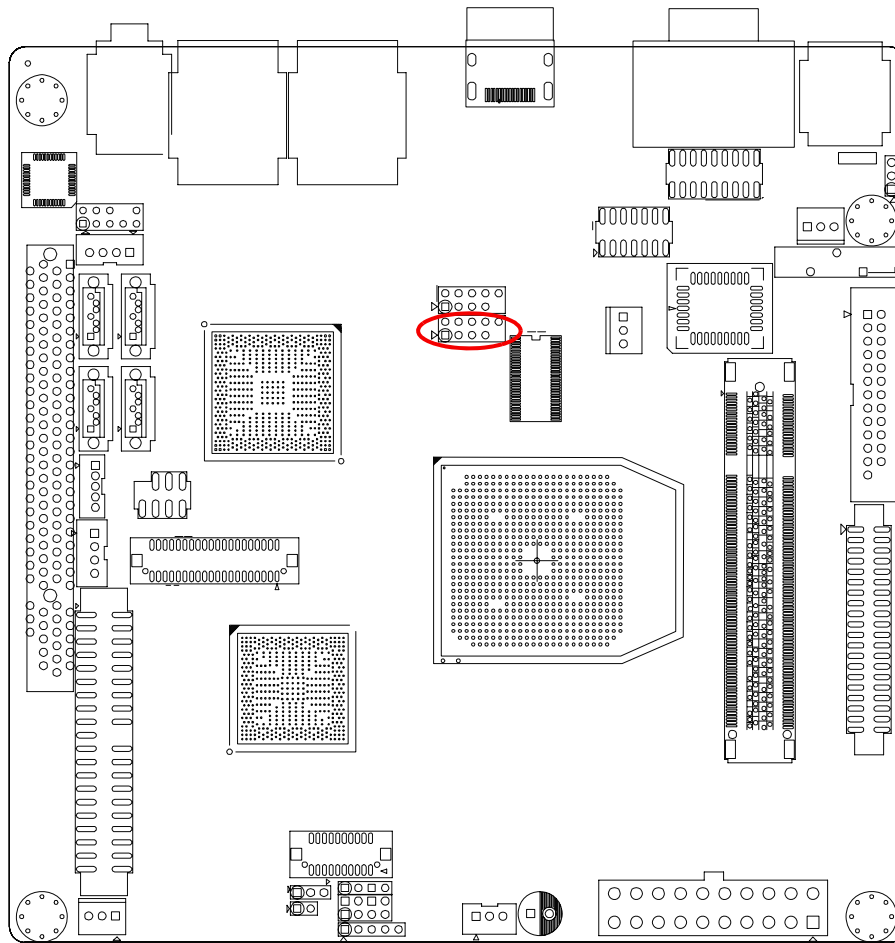
USB56			
pin.1	VCC	pin.2	VCC
pin.3	USB_N4	pin.4	USB_N5
pin.5	USB_P4	pin.6	USB_P5
pin.7	GND	pin.8	GND
KEY -		pin.10	GND

2.17 USB78
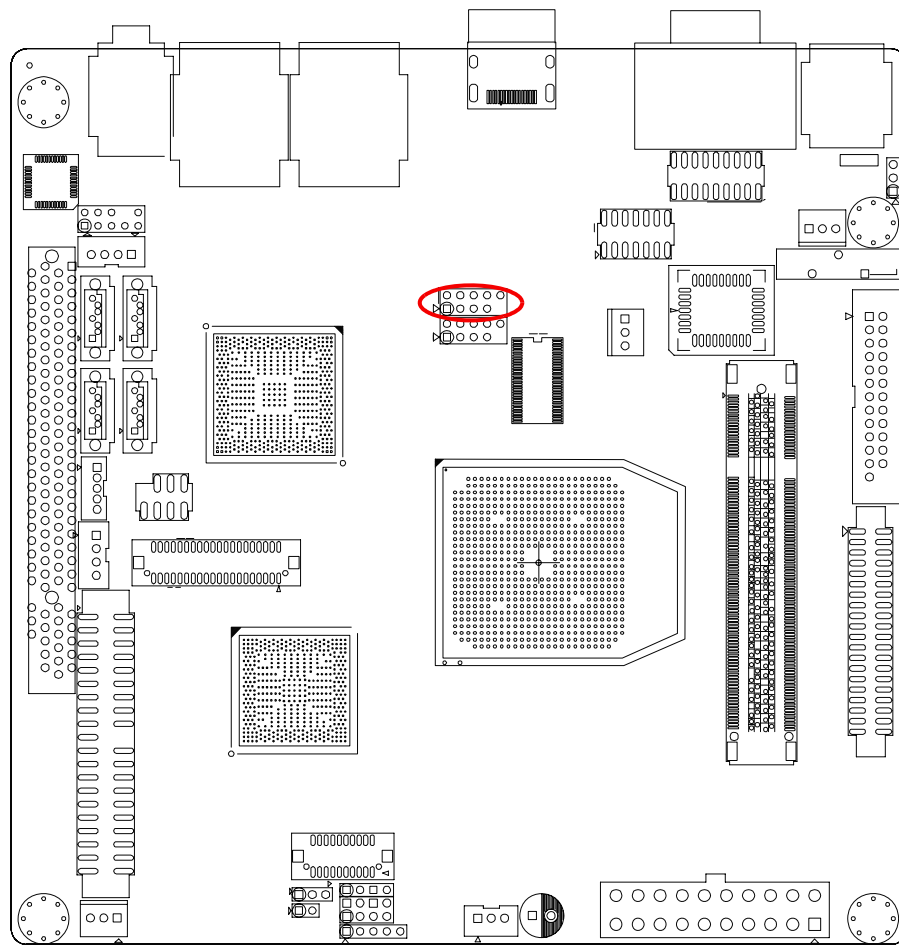
USB78			
pin.1	VCC	pin.2	VCC
pin.3	USB_N6	pin.4	USB_N7
pin.5	USB_P6	pin.6	USB_P7
pin.7	GND	pin.8	GND
KEY -		pin.10	GND

2.18 Audio
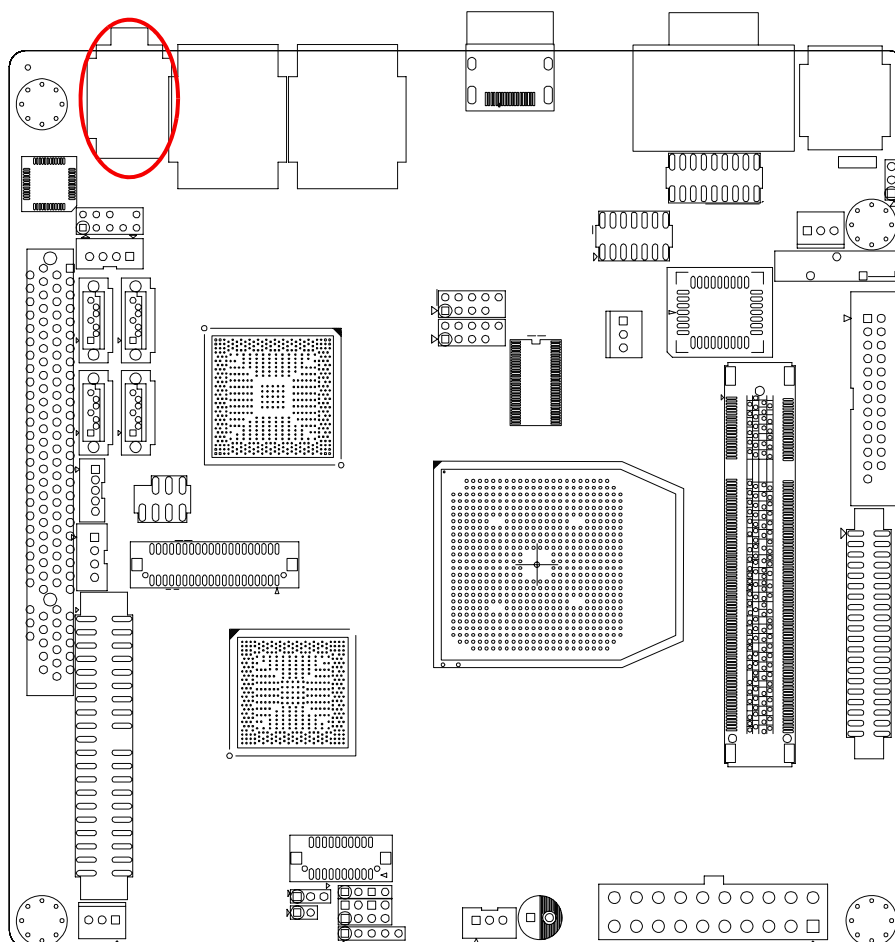
AUDIO1	
pin.A1	GND
pin.A2	MIC_IN2
pin.A3	NC
pin.A4	NC
pin.A5	MIC_IN1
pin.B2	LINEOUT_L
pin.B3	NC
pin.B4	NC
pin.B5	LINEOUT_R
pin.C2	LINEIN_L
pin.C3	NC
pin.C4	NC
pin.C5	LINEIN_R

2.19 FPAUD1
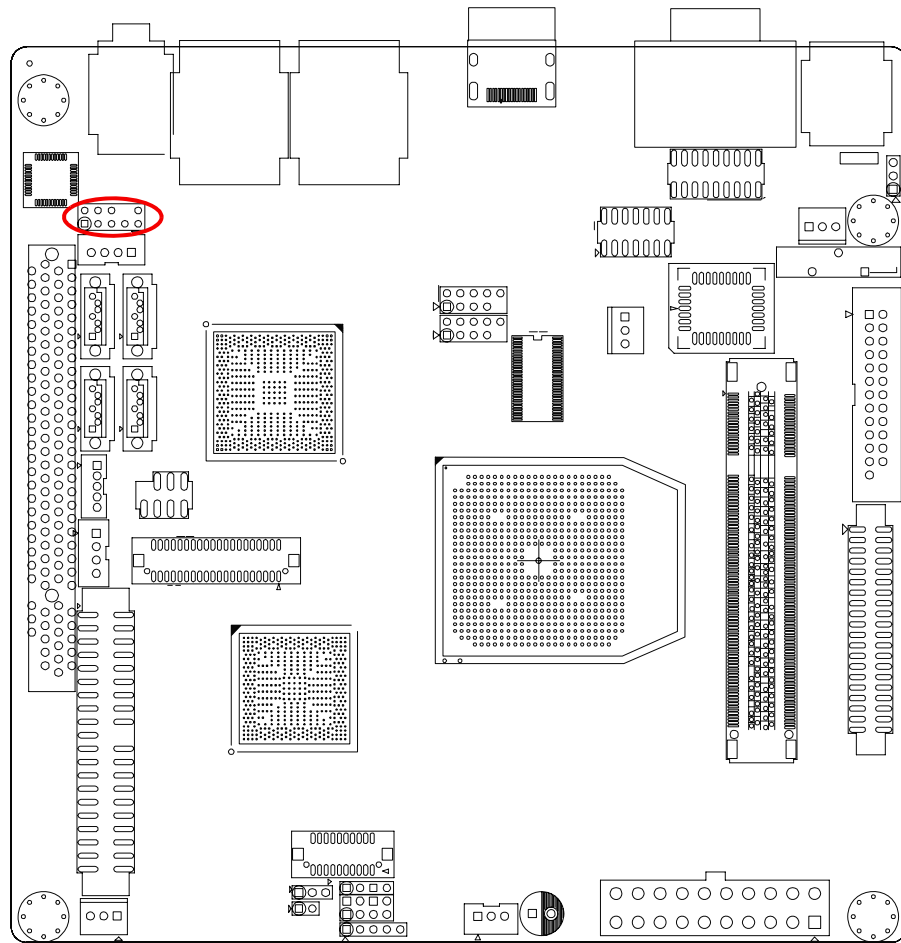
FPAUD1			
pin.1	FP_MIC_IN1	pin.2	GND
pin.3	MIC_VREF	pin.4	VCC
pin.5	REAR_LO_R	pin.6	LINEOUT_R
pin.7	NC	KEY	
pin.9	REAR_LO_L	pin.10	LINEOUT_L

2.20 SPKOUT1
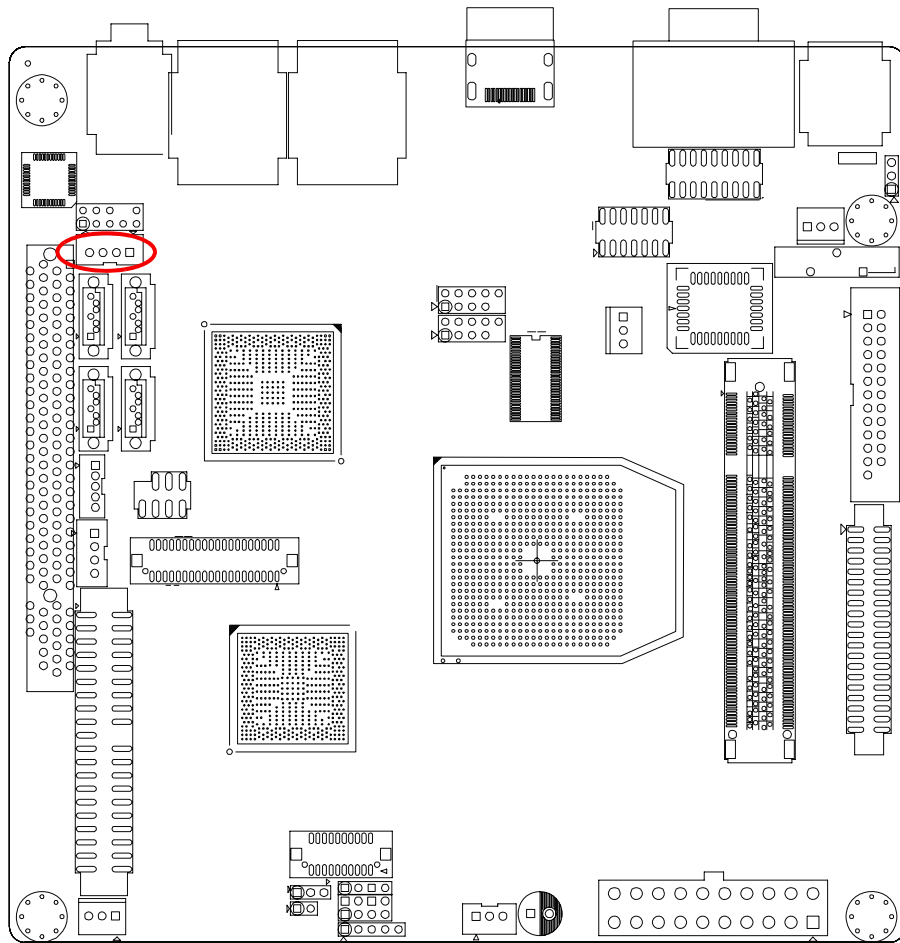
SPKOUT1	
pin.1	AMP_L
pin.2	AMP_L#
pin.3	AMP_R#
pin.4	AMP_R

2.21 Serial ATA Interface (SATA1, SATA2, SATA3, SATA4)

SATA2

GND
SATA_PXP1
SATA_PXN1
GND
SATA_RXN1
SATA_RXP1
1   GND

SATA4

GND
SATA_PXP3
SATA_PXN3
GND
SATA_RXN3
SATA_RXP3
1   GND

SATA1

GND
SATA_PXP0
SATA_PXN0
GND
SATA_RXN0
SATA_RXP0
1   GND

SATA3

GND
SATA_PXP2
SATA_PXN2
GND
SATA_RXN2
SATA_RXP2
1   GND
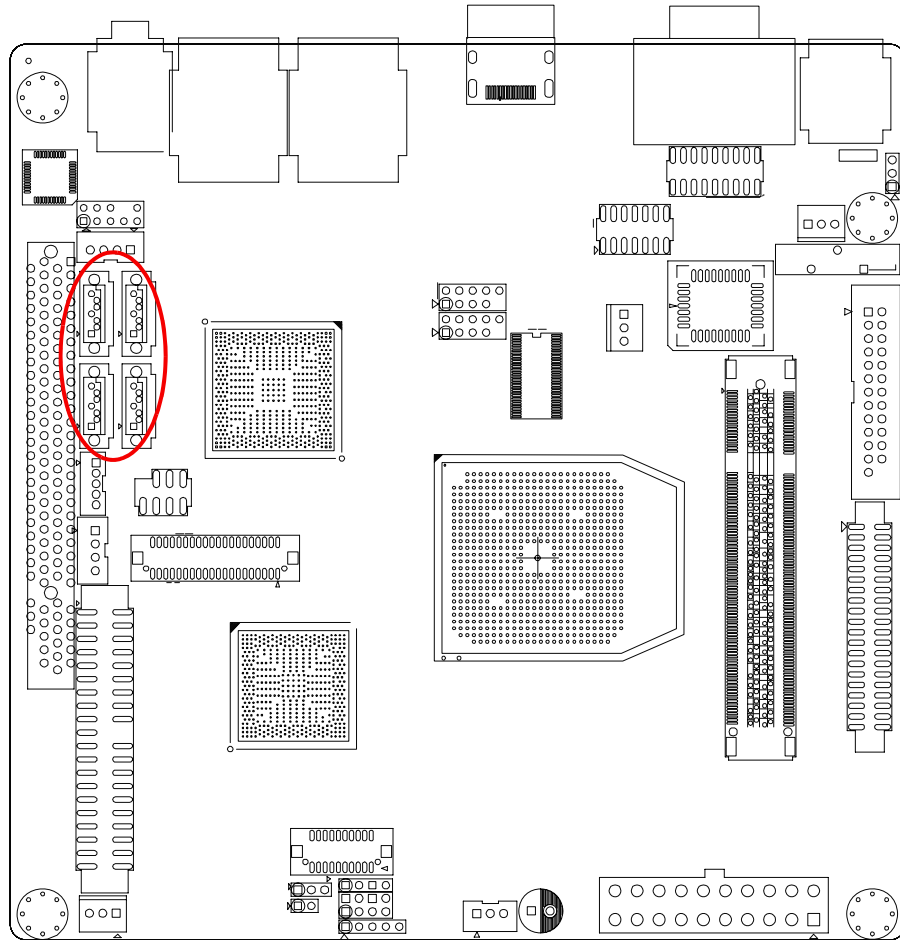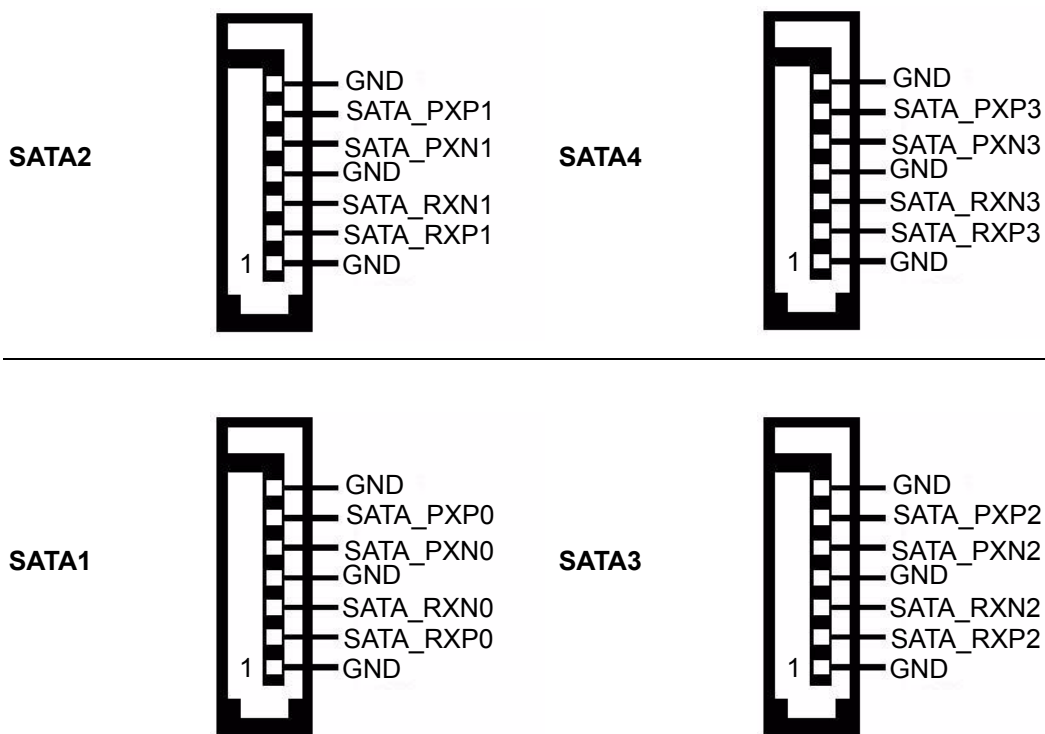
SATA1		SATA2		SATA3		SATA4	
pin.1	GND	pin.1	GND	pin.1	GND	pin.1	GND
pin.2	SATA_TXP0	pin.2	SATA_TXP1	pin.2	SATA_TXP2	pin.2	SATA_TXP3
pin.3	SATA_TXN0	pin.3	SATA_TXN1	pin.3	SATA_TXN2	pin.3	SATA_TXN3
pin.4	GND	pin.4	GND	pin.4	GND	pin.4	GND
pin.5	SATA_RXN0	pin.5	SATA_RXN1	pin.5	SATA_RXN2	pin.5	SATA_RXN3
pin.6	SATA_RXP0	pin.6	SATA_RXP1	pin.6	SATA_RXP2	pin.6	SATA_RXP3
pin.7	GND	pin.7	GND	pin.7	GND	pin.7	GND

2.22 INV1
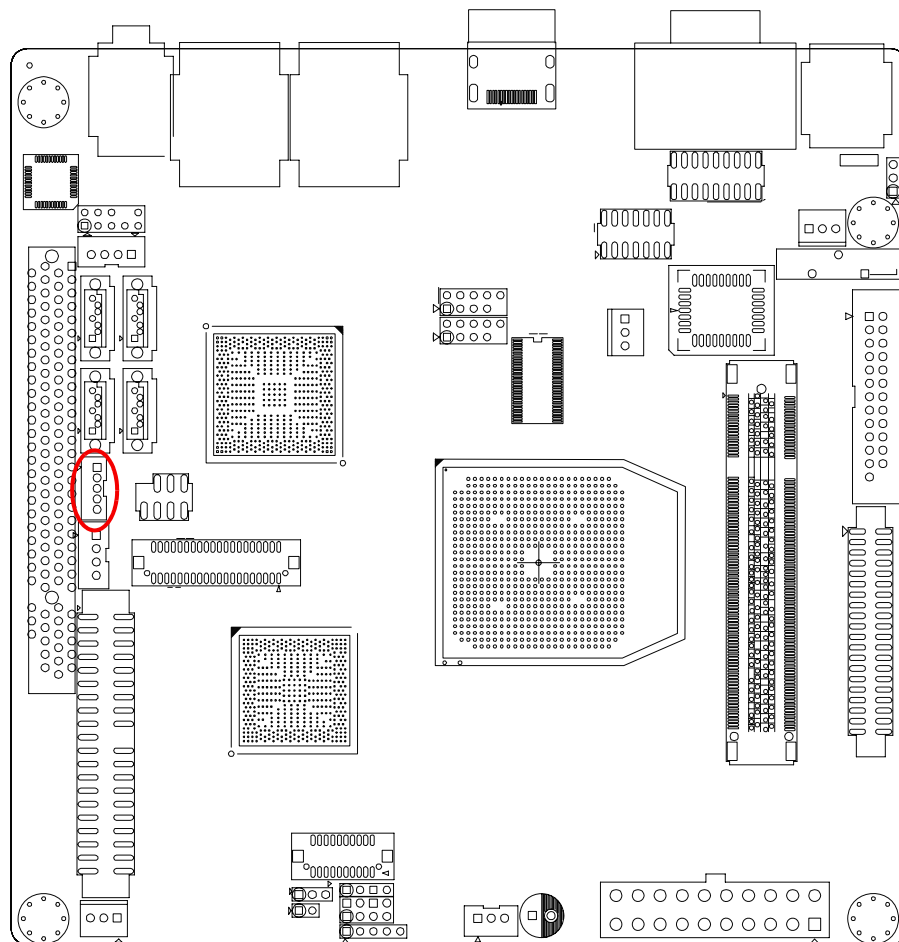
INV1	
pin.1	VCC12
pin.2	GND
pin.3	BL_EN
pin.4	NC
pin.5	VCC

INV is connected to an inverter that can provide power to an LCD panel.

The AIMB-221 can drive an LVDS display, and you can install an LVDS display with the following accessories.

2.23 VGA2 (TV-Out) (Optional)
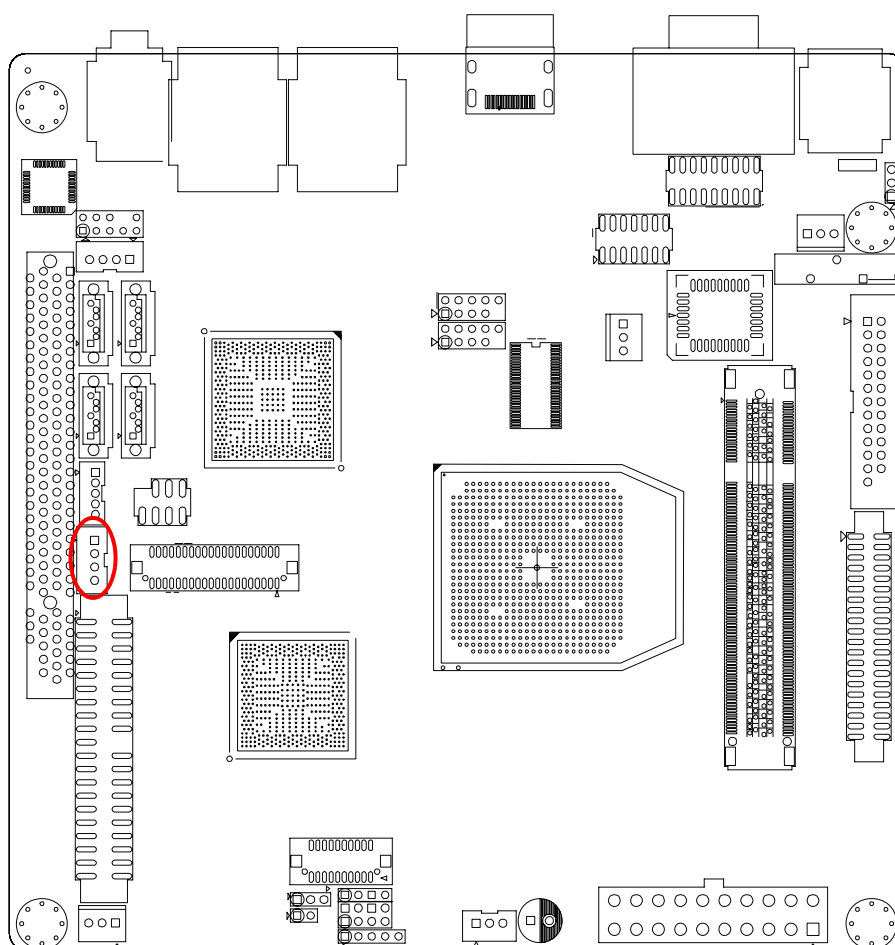
TVOUT1	
pin.1	CVBS
pin.2	Y
pin.3	C
pin.4	GND

The TV-out feature is an optional feature that is supported by AMD M690T. Customers who utilize the TV-out feature must have the Macrovision Licensee membership.

Signal	Signal Description
Y	Luma / Green Output. This pin outputs a selectable video signal. The output is designed to drive a 75 ohm doubly terminated load. The output can be selected to be S-video luminance or green.
C	Chroma / Green Output. This pin outputs a selectable video signal. The output is designed to drive a 75 ohm doubly terminated load. The output can be selected to be S-video chrominance or red
CVBS	Composite Video / Blue Output. Chroma / Green Output. This pin outputs a selectable video signal. The output is designed to drive a 75 ohm doubly terminated load. The output can be selected to be composite video or blue.

Note! *When switching to the TV-out display, please right click the ATI Display Manager from the system tray, and then setup the TV-Out display as below shown.*

Right click the grey TV icon and select the display mode:
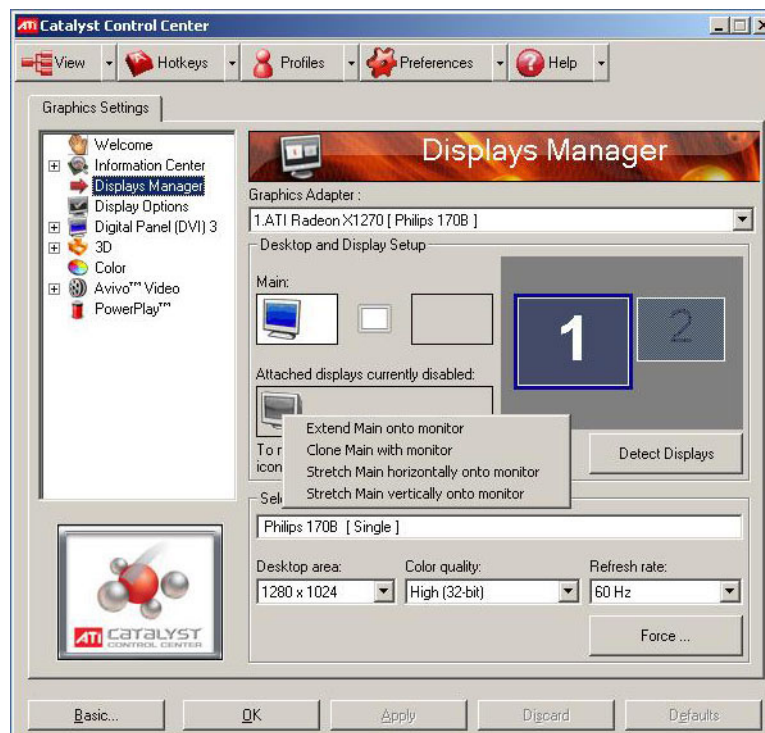
Note! *TV-out use the same signal output channel as CRT due to the hardware design. Therefore, the dual display of CRT and TV-Out is not supported.*

2.24 LVDS
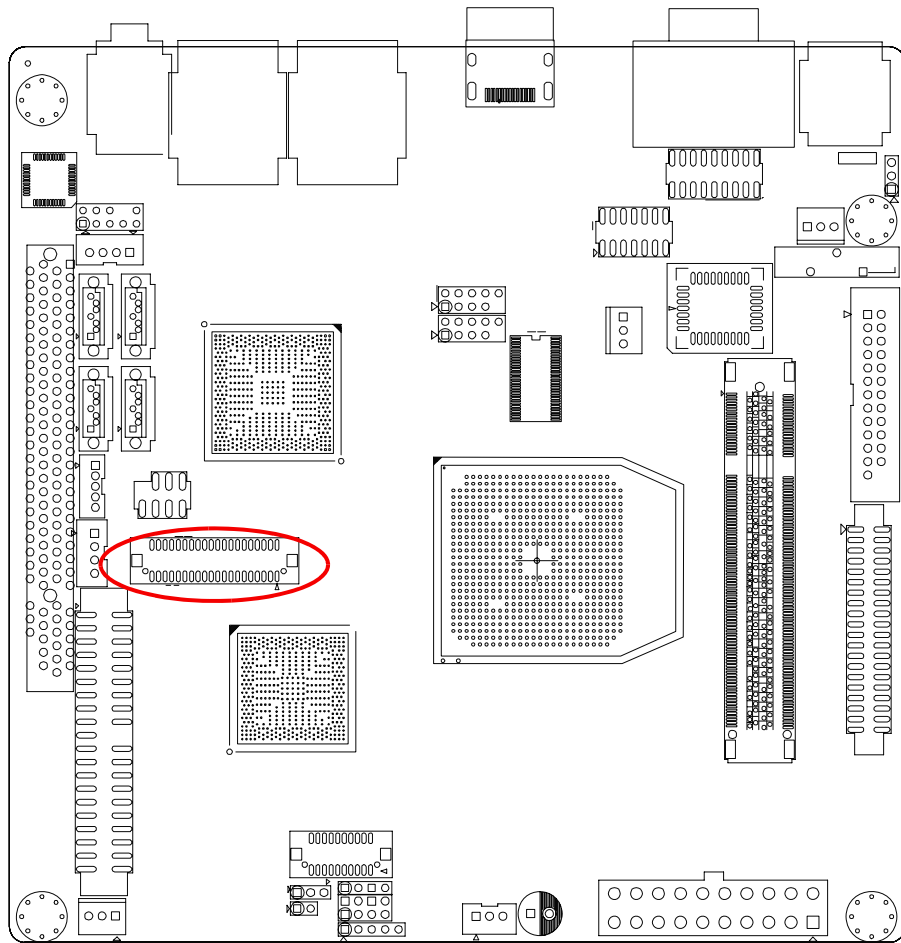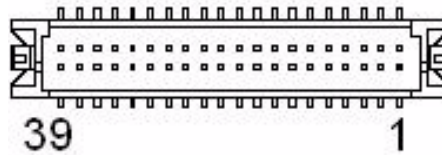
LVDS1

pin.1	LVDS_VCC	pin.2	LVDS_VCC
pin.3	GND	pin.4	GND
pin.5	LVDS_VCC	pin.6	LVDS_VCC
pin.7	LVDS_L0N	pin.8	UVDS_U0N
pin.9	LVDS_L0P	pin.10	UVDS_U0P
pin.11	GND	pin.12	GND
pin.13	LVDS_L1N	pin.14	UVDS_U1N
pin.15	LVDS_L1P	pin.16	UVDS_U1P
pin.17	GND	pin.18	GND
pin.19	LVDS_L2N	pin.20	UVDS_U2N
pin.21	LVDS_L2P	pin.22	UVDS_U2P
pin.23	GND	pin.24	GND
pin.25	LVDS_LCLKN	pin.26	LVDS_UCLKN
pin.27	LVDS_LCLKP	pin.28	LVDS_UCLKP
pin.29	GND	pin.30	GND
pin.31	DDC_CLK	pin.32	DDC_DAT
pin.33	GND	pin.34	GND
pin.35	LVDS_L3N	pin.36	LVDS_U3N
pin.37	LVDS_L3P	pin.38	LVDS_U3P
pin.39	LVDS_BLEN1	pin.40	NC

2.25 LVDS POWER JUMPER (JLVDS1)

JLVDS1 is the jumper for either 3.3 V or 5 V output when connect to LCD panel.
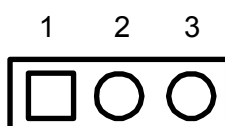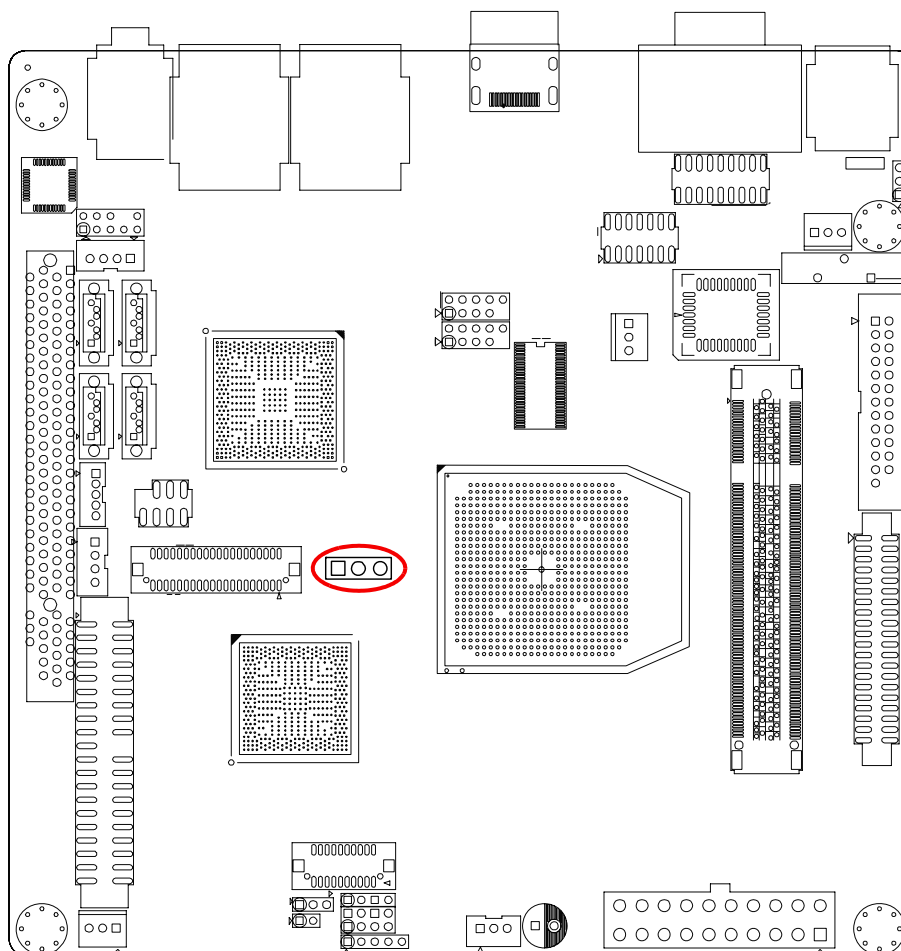
JLVDS1	
pin.1	VCC3
pin.2	LVDS_VCC
pin.3	VCC

Chapter   **3**

Award BIOS Setup

3.1 Introduction

3.1.1 BIOS Setup program

This motherboard supports a programmable firmware chip that you can update. Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to "Run Setup". This section explains how to configure your system using this utility.

Even if you are not prompted to use the BIOS Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the SPI chip.

The firmware chip on the motherboard stores the BIOS Setup program. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

If you wish to enter the BIOS Setup program after POST, reboot the system by doing any of the following procedures:

- Restart using the OS standard shut-down procedure.
- Press <Ctrl>+<Alt>+<Del> simultaneously.
- Press the reset button on the system chassis.
- Press the power button to turn the system off then back on.

The BIOS Setup program is designed for ease-of-use. It is a menu-driven program that lets you browse the various submenus and make your selections from the available options using the navigation keys.

Caution! *Using the **power button**, **reset button** or the **<Ctrl>+<Alt>+<Del>** keys to force a reset from a running operating system can cause damage to your data or system. We recommend to always shut-down the system properly from the operating system.*

Note!
1. *The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Select the Load Setup Defaults item under the Exit Menu.*
2. *The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.*
3. *Save a copy of the original motherboard BIOS file to a bootable floppy disk or a USB flash disk in case you need to restore the BIOS in the future.*

3.1.2 CMOS RAM Auto-backup and Restore

The CMOS RAM is powered by an onboard button cell battery. When you finish BIOS setup, the data in CMOS RAM will be automatically backed up to flash memory. If operation in harsh industrial environments causes a soft error, the BIOS will check the data in CMOS RAM and automatically restore the original data from flash memory to CMOS RAM for booting.

Note!   *To change the CMOS setting without restoring the previous backup, press "DEL" within two seconds of the "CMOS checksum error..." message appearing and then use the "Setup" screen to modify the configuration. If the "CMOS checksum error..." message appears again and again, please check to see if you need to replace the battery in your system.*

Note!   *ATI SB600 cannot restore system date and time, once the CMOS is cleared.*

3.2 Entering Setup

Turn on the computer and press <Del> to enter the BIOS setup.

```
         Phoenix - Award WorkstationBIOS CMOS Setup Utility
 ┌──────────────────────────────────┬──────────────────────────────────┐
 │ ▶ Standard CMOS Features          │ ▶ PC Health Status               │
 │                                   │                                  │
 │ ▶ Advanced BIOS Features          │ ▶ Frequency/Voltage Control      │
 │                                   │                                  │
 │ ▶ Advanced Chipset Features        │   Load SetUp Defaults            │
 │                                   │                                  │
 │ ▶ Integrated Peripherals          │   Set Password                   │
 │                                   │                                  │
 │ ▶ Security Chip Configuration     │   Save & Exit Setup              │
 │                                   │                                  │
 │ ▶ Power Management Setup           │   Exit Without Saving            │
 │                                   │                                  │
 │ ▶ PnP/PCI Configurations          │                                  │
 ├──────────────────────────────────┴──────────────────────────────────┤
 │ Esc : Quit                        ↑ ↓ → ←   : Select Item            │
 │ F10 : Save & Exit Setup                                              │
 ├──────────────────────────────────────────────────────────────────────┤
 │               Time, Date, Hard Disk Type...                          │
 └──────────────────────────────────────────────────────────────────────┘
```

Figure 3.1 Award BIOS Setup initial screen

3.3 Standard CMOS Setup

```
          Phoenix - Award WorkstationBIOS CMOS Setup Utility
                         Standard CMOS Features

    Date (mm:dd:yy)            Fri, Dec  5 2008          Item Help
    Time (hh:mm:ss)            13 : 43 : 59
                                                    Menu Level    ▶
  ▶ IDE Channel 0 Master       [ None]
  ▶ IDE Channel 0 Slave        [ None]              Change the day, month,
  ▶ IDE Channel 2 Master       [ None]              year and century
  ▶ IDE Channel 2 Slave        [ None]
  ▶ IDE Channel 3 Master       [ None]
  ▶ IDE Channel 3 Slave        [ None]
    Halt On                    [All , But Keyboard]

    Base Memory                     639K
    Extended Memory             4062208K
    Total Memory                4063232K



  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
             F5:Previous Values                F7: SetUp Defaults
```

Figure 3.2 Standard CMOS Features Screen

3.3.1 Date

The date format is:

<day of the week>, <month> <day of the month> <year>.

3.3.2 Time

The time format is <hour> : <minute> : <second>, based on the 24-hour clock.

3.3.3 IDE channel 0/1 Master/Slave

■ **IDE HDD Auto-Detection:** Press "Enter" to select this option for automatic device detection.

■ **IDE Device Setup:**
  – **Auto:** Automatically detects IDE devices during POST.
  – **None:** Select this when no IDE device is used. The system will skip the auto-detection step to make system start up faster.
  – **Manual:** Use this for manual configuration.

■ **Access Mode:** The options are CHS/LBA/Large/Auto

■ **Capacity:** Capacity of currently installed hard disk.

■ **Cylinder:** Number of cylinders

■ **Head:** Number of heads

■ **Precomp:** Write precomp

■ **Landing Zone:** Landing zone

■ **Sector:** Number of sectors

3.3.4 Drive A / Drive B

This category identifies the types of floppy disk drives installed in the system. The options are: None/360 K, 5.25"/1.2 M, 5.25"/720 K, 3.5"/1.44 M, 3.5"/2.88 M & 3.5".

3.3.5 Video

This category detects the type of adapter used for the primary system monitor that must match your video display card and monitor.

- **EGA / VGA:** Enhanced Graphics Adapter / Video Graphics Array. For EGA, VGA, SVGA or PGA adapters
- **CGA 40:** Color Graphics Adapter, power up in 40 column mode
- **CGA 80:** Color Graphics Adapter, power up in 80 column mode
- **MONO:** Monochrome adapter, includes high resolution monochrome adapters

3.3.6 Halt On

This category determines whether system start-up will halt or not when an error is detected during power up.

The options are: No Errors, All Errors, All But Keyboard, All But Diskette, All But Disk/Keyboard

3.3.7 Memory

This category displays base memory, extended memory, and total memory detected during POST (Power On Self Test).

3.4 Advanced BIOS Features

The "Advanced BIOS Features" screen appears when choosing the "Advanced BIOS Features" item from the "Initial Setup Screen" menu. It allows the user to configure the AIMB-221 according to his particular requirements. Below are some major items that are provided in the Advanced BIOS Features screen. A quick booting function is provided for your convenience. Simply enable the Quick Booting item to save yourself valuable time.
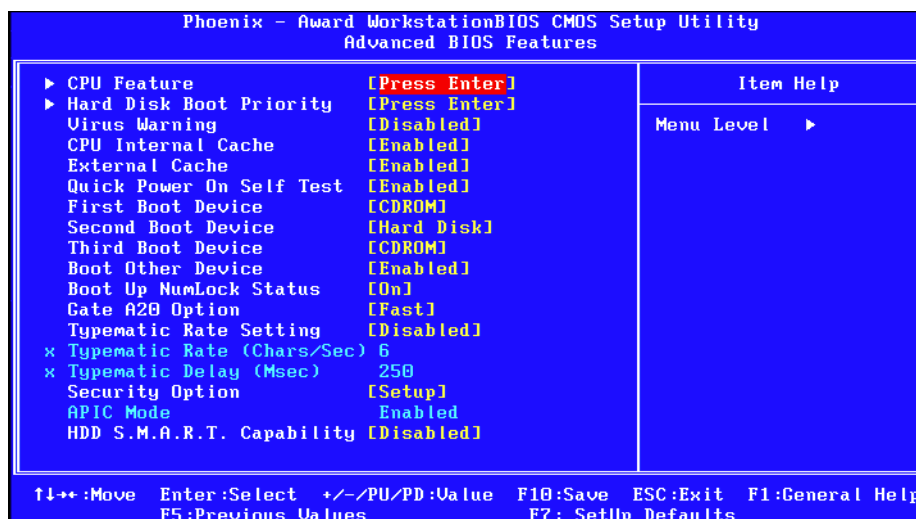
Figure 3.3 Advanced BIOS Features screen

3.4.1 CPU Features

■ **Thermal Management**

This feature controls the activation of the Thermal Monitor's automatic mode. It allows you to determine when the Pentium 4's Thermal Monitor should be activated in automatic mode after the system boots. For example, with the default value of 16 Minutes, the BIOS activates the Thermal Monitor in automatic mode 16 minutes after the system starts booting up. The choices are 4 Min, 8 Min, 16 Min and 32 Min.

■ **Limit CPUID MaxVal**

Set Limit CPUID MaxVa1 to 3. This should be disabled for Windows XP.

■ **C1E Function:**

This option sets the CPU C1E function.

■ **Execute Disable Bit**

When disabled, this option forces the XD feature flag to always return 0.

3.4.2 Hard Disk Boot Priority

This option sets hard disk boot device priority.

3.4.3 Virus Warning

Enables or disables the virus warning.

3.4.4 CPU L1, L2 & L3 Cache

Enabling this feature speeds up memory access. The commands are "Enabled" or "Disabled".

3.4.5 Hyper-Threading Technology

While using a CPU with Hyper-Threading technology, you can select "Enabled" to enable Hyper-Threading Technology in an OS that supports Hyper-Threading Technology or select "Disabled" for other OSs that do not support Hyper-Threading technology.

3.4.6 Quick Power On Self Test

This allows the system to skip certain tests to speed up the boot-up procedure.

3.4.7 First/Second/Third Boot Device

The BIOS tries to load the OS from the devices in the sequence set here. The options are: "Floppy", "LS120", "Hard disk", "CDROM", "ZIP100", "USB-FDD", "USB-ZIP", "USBCDROM", "USB-HDD", "LAN" and "Disabled".

3.4.8 Boot Other Device

Use this to boot another device. The options are "Enabled" and "Disabled".

3.4.9 Swap Floppy Drive

If the system has two floppy drives, choose "Enabled" to assign physical drive B to logical drive A and vice-versa. The commands are "Enabled" or "Disabled".

3.4.10 Boot Up Floppy Seek

Selection of the command "Disabled" will speed the boot up. Selection of "Enabled" searches for floppy disk drives during boot up.

3.4.11 Boot Up NumLock Status

Sets the boot up status Num Lock. The options are "On" and "Off".

3.4.12 Gate A20 Option

"Normal": A pin in the keyboard controller controls GateA20. Fast (Default) lets the chipset control GateA20.

3.4.13 Typematic Rate Setting

The typematic rate is the rate key strokes repeat as determined by the keyboard controller. The commands are "Enabled" or "Disabled". Enabling allows the typematic rate and delay to be selected.

3.4.14 Typematic Rate (Chars/Sec)

The BIOS accepts the following input values (characters/second) for typematic rate: 6, 8, 10, 12, 15, 20, 24 and 30.

3.4.15 Typematic Delay (msec)

Typematic delay is the time interval between the appearances of two consecutive characters, when the key is continuously depressed. The input values for this category are: 250, 500, 750 and 1000 ms.

3.4.16 Security Option

This category determines whether the password is required when the system boots up or only when entering setup. The options are:

- **System:** The system will not boot, and access to Setup will be also denied unless the correct password is entered at the prompt.
- **Setup:** The system will boot, but access to Setup will be denied unless the correct password is entered at the prompt.

Note! *To disable security, select PASSWORD SETTING in the main menu. You will be asked to enter a password. Press <Enter> to disable security. When security is disabled, the system will boot and you can enter Setup freely.*

3.4.17 APIC Mode

This setting enables or disables the Advanced Configuration and Power Interface (ACPI) support in the Advanced Programmable Interrupt Controller (APIC).

3.5   Advanced Chipset Features

Choose the "Advanced Chipset Features" option from the "Initial Setup Screen" menu to show the following screen.


```
          Phoenix - Award WorkstationBIOS CMOS Setup Utility
                       Advanced Chipset Features
 ▶  IGX Configuration            [Press Enter]          Item Help
    NB Azalia                    [Enabled]
    Memory Hole                  [Disabled]        Menu Level    ▶
    System BIOS Cacheable        [Disabled]




↑↓→← :Move   Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
             F5:Previous Values               F7: SetUp Defaults
```
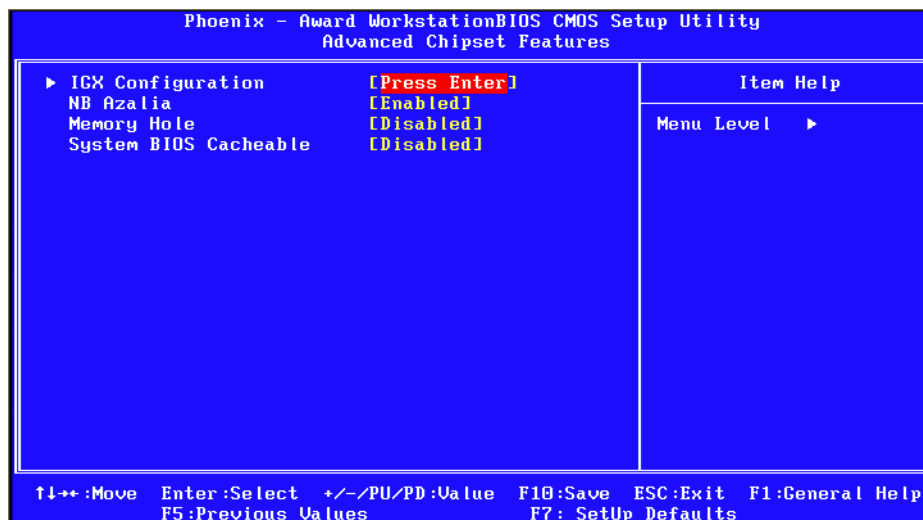
Figure 3.4 Advanced Chipset Features screen

> **Note!**   *DRAM default timings have been carefully chosen and should ONLY be changed if data is being lost. Please contact technical support before changing these timings.*

3.5.1   Memory Hole At 15M-16M

Enabling this feature reserves the 15 MB to 16 MB memory address space for ISA expansion cards that specifically require this setting. This makes memory from 15 MB and up unavailable to the system. Expansion cards can only access memory up to 16 MB. The default setting is "Disabled".

3.5.2   Configure AMT BIOS Support (Intel Active Management Technology)

This option allows you to enable or disable the Intel AMT (Active Management Technology). Intel AMT is the next generation of network client management. Intel AMT is a set of advanced manageability features developed as a direct result of IT customer feedback gained through Intel market research. With the new implementation of System Defense in ICH8DO, the advanced manageability feature set of Intel AMT is further enhanced. Further details please browse Intel web site: www.intel.com.

> **Warning!**   *The Intel Active Management Technology requires the Intel AMT-enabled software. Also, the platform must be connected to a power source and an active LAN port.*

3.5.3   PEG / Onchip VGA Control

Use this field to select PEG or Onchip VGA. The default is AUTO.

3.5.4 On-Chip Frame Buffer Size

The On-Chip Frame Buffer Size can be set to 1 MB or 8 MB. This memory is shared with the system memory.

3.5.5 DVMT Mode

This option shows the active system memory mode.

3.5.6 DVMT / FIXED Memory Size

This option specifies the size of DVMT / FIXED system memory to allocate for video memory.

3.5.7 Init Display First

Choose the first display interface to initiate while booting. The choice is "PCI Slot" or "Onboard".

3.6 Integrated Peripherals


```
            Phoenix - Award WorkstationBIOS CMOS Setup Utility
                          Integrated Peripherals

   ▶ Onboard Devices              [Press Enter]          Item Help
   ▶ South OnChip IDE Device      [Press Enter]
   ▶ South OnChip PCI Device      [Press Enter]    Menu Level    ▶
     Init Display First           [Onboard]
     USB EHCI Controller          [Enabled]
     OnChip USB Controller        [Enabled]
     Legacy USB Controller        [Enabled]
     USB Mouse Support            [Disabled]
     IDE HDD Block Mode           [Enabled]
     Onboard Serial Port 1        [3F8/IRQ4]
     Onboard Serial Port 2        [2F8/IRQ3]
     Onboard Serial Port 3        [3E8/IRQ4]
     Onboard Serial Port 4        [2E8/IRQ3]
     Onboard Serial Port 5        [338/IRQ5]
     Onboard Serial Port 6        [238/IRQ7]
     Onboard Parallel Port        [378/IRQ7]
     Parallel Port Mode           [Standard]
   x ECP Mode Use DMA                 3

   ↑↓→← :Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
              F5:Previous Values              F7: SetUp Defaults
```

Figure 3.5 Integrated peripherals


```
            Phoenix - Award WorkstationBIOS CMOS Setup Utility
                          South OnChip IDE Device

     IDE DMA transfer access      [Enabled]             Item Help
     OnChip IDE Channel0          [Enabled]
     Primary Master    PIO        [Auto]          Menu Level    ▶
     Primary Slave     PIO        [Auto]
     Primary Master    UDMA       [Auto]
     Primary Slave     UDMA       [Auto]

   ↑↓→← :Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
              F5:Previous Values              F7: SetUp Defaults
```
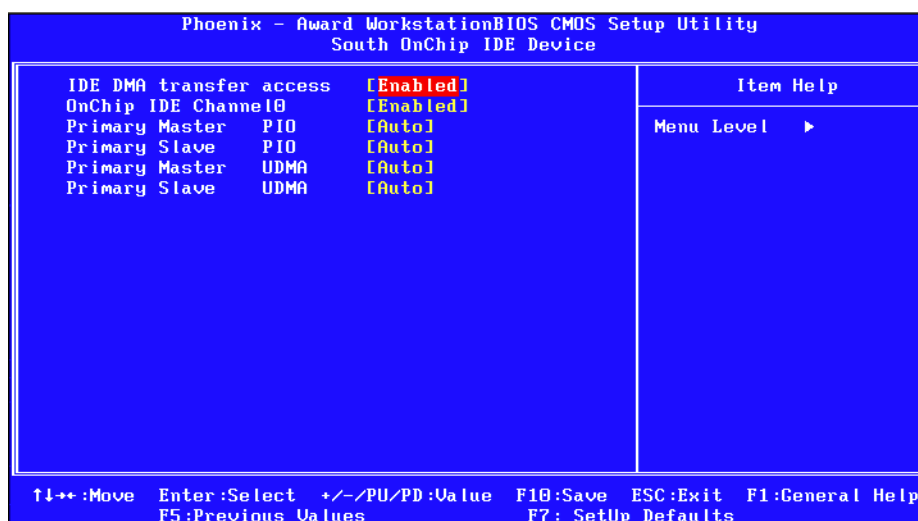
Figure 3.6 On-Chip IDE Device

3.6.1 IDE HDD Block Mode

If your IDE hard drive supports block mode, select Enabled to automatically detect the optimal number of block read/writes per sector that the drive can support.

3.6.2 IDE DMA Transfer Access

Use this field to enable or disable IDE DMA transfer access.

3.6.3 IDE Primary Master/Slave PIO/UDMA Mode (Auto)

Each IDE channel has both a master and a slave, making four IDE devices possible. Because two IDE devices may have a different Mode timings (0, 1, 2, 3, 4), it is necessary for these to be independent. The default setting "Auto" will allow auto detection to ensure optimal performance.

3.6.4 SATA Mode

The SATA modes are IDE, RAID and AHCI Mode. Select [IDE] if you want to have SATA function as IDE. Select [AHCI] to enable the Advanced Host Controller Interface (AHCI) feature, with improved SATA performance and native command queuing.

```
            Phoenix - Award WorkstationBIOS CMOS Setup Utility
                         South OnChip PCI Device

    ATI SB AC97 AudioAuto       [Auto]                Item Help
    OnChip SATA Controller      [Enabled]
    OnChip SATA Type            [AHCI]          Menu Level    ►











    ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
            F5:Previous Values                F7: SetUp Defaults
```
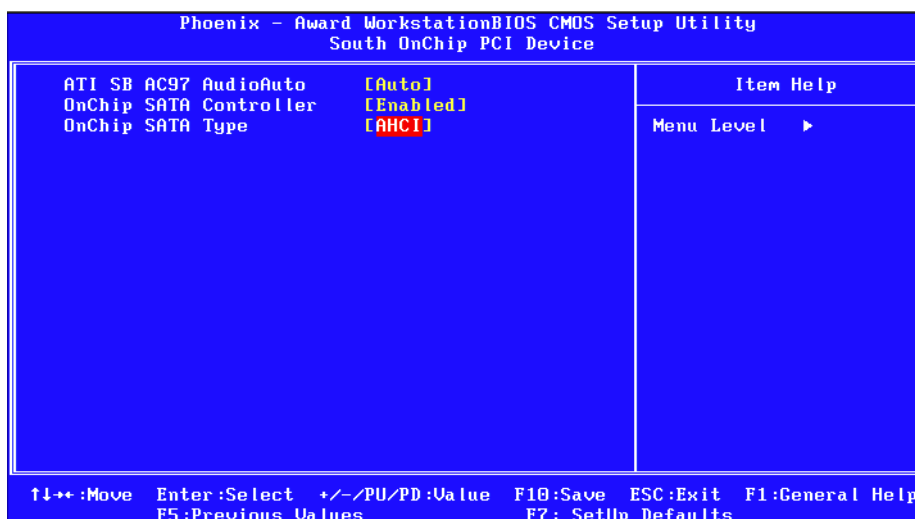
Press [Ctrl + F] to enter the ATI FastBuild^{TM} Utility when the below screen appears.

```
RAID BIOS Version 2.5.1540.38
(c) 2006 ATI Technology, Inc. All rights reserved.

ID    MODE            SIZE      TRACK-MAPPING     STATUS

3     1+0 JBOD        80027M    9729/255/63       Functional


Press <Ctrl-F> to enter FastBuild (tm) Utility..._
```
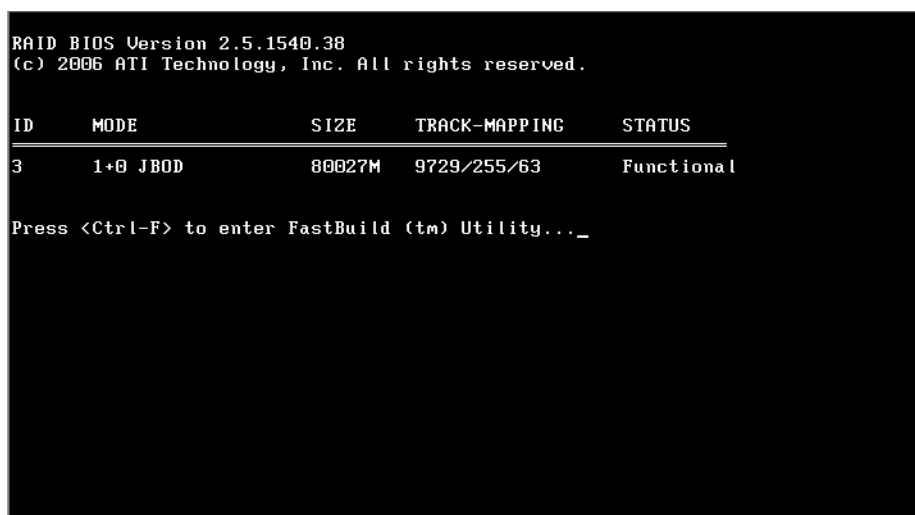
Set the RAID mode as JBOD, and then select the HDD. Save and exit. Please note that to set 2 JBODs needs to set up twice, and so on.

```
FastBuild (tm) Utility (c) 2006 ATI Technology, Inc.
=================[ Define LD Menu ]=================

   LD No        RAID Mode      Total Drv   Capacity(MB)   Status
   LD  1         ----           ----        ------         ----
   LD  2         ----           ----        ------         ----
   LD  3         JBOD            1           80027         Functional
   LD  4         ----           ----        ------         ----
   LD  5         ----           ----        ------         ----
   LD  6         ----           ----        ------         ----
   LD  7         ----           ----        ------         ----
   LD  8         ----           ----        ------         ----




==================[ Keys Available ]==================

 [↑] Up    [↓] Down    [ESC] Exit    [Enter] Select
```

```
FastBuild (tm) Utility (c) 2006 ATI Technology, Inc.
===============[ View LD Definition Menu ]===============

   LD No        RAID Mode      Total Drv   Capacity(MB)   Status

   LD  3         JBOD            1           80027         Functional

   Stripe Block:      NA                  Cache Mode:  NA


=================[ Drives Assignments ]=================
 Channel:ID          Drive Model           Capacity (MB)
      3:Mas   WDC WD800AAJS-00PSA              80027




            Any Key to Continue.......
```

Enter the Hard Disk Boot Priority, the RAID HDD will be displayed.

```
          Phoenix - Award WorkstationBIOS CMOS Setup Utility
                       Hard Disk Boot Priority

   1. SCSI-0    :  RAID Ary 3                    Item Help
   2. Bootable Add-in Cards
                                               Menu Level   ▶

                                               Use <↑> or <↓> to
                                               select a device , then
                                               press <+> to move it
                                               up , or <-> to move it
                                               down the list. Press
                                               <ESC> to exit this
                                               menu.




   ↑↓:Move     PU/PD/+/-:Change Priority     F10:Save      ESC:Exit
   F5:Previous Values    F6:Fail-Safe Defaults    F7:Optimized Defaults
```
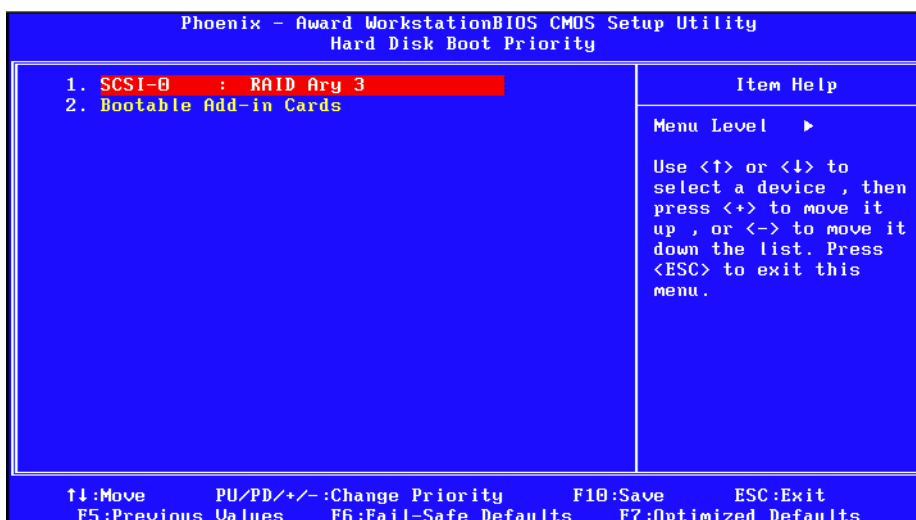
3.6.5 Legacy mode support

This allows a SATA system to support PATA mode. The choices are "Disabled" and "Enabled".

Note! *Please refer to the Intel Matrix Storage Technology quick start guide and the Intel Matrix Storage Manager User's Manual in the MANUAL folder of this CD to find out how to build and configure your RAID 0, 1, 10 or 5 system using Intel Matrix Storage Technology and Matrix Storage Manager.*

```
            Phoenix - Award WorkstationBIOS CMOS Setup Utility
                              Onboard Devices

     Onboard LAN1 Controller     [Enabled]              Item Help
     Onboard LAN1 Boot ROM       [Disabled]
     Onboard LAN2 Controller     [Enabled]         Menu Level    ▶
     Onboard LAN2 Boot ROM       [Disabled]









   ↑↓→← :Move   Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
                 F5:Previous Values                  F7: SetUp Defaults
```
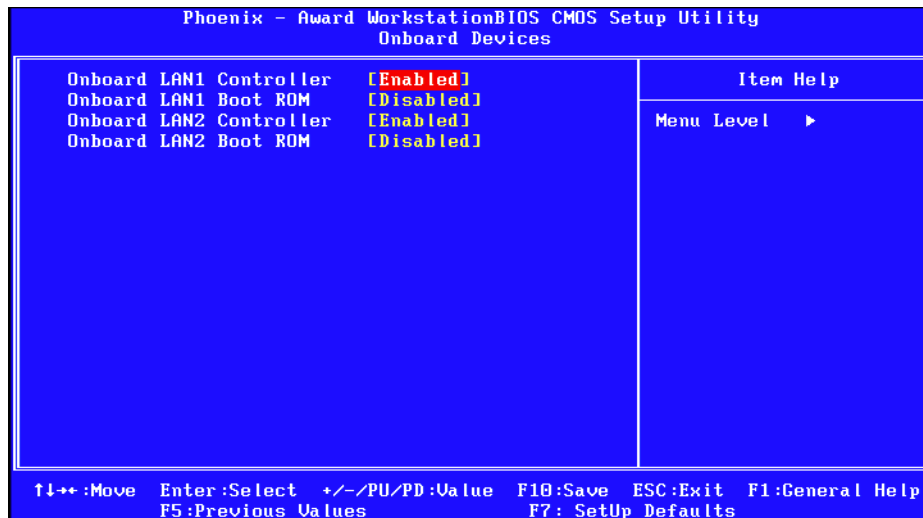
Figure 3.7 Onboard Device

3.6.6 On board LAN1 ROM

The options are "Enabled" and "Disabled". Select "Disabled" if you don't want to use the onboard LAN1 option ROM.

3.6.7 Onboard LAN2 Control

The options are "Enabled" and "Disabled". Select "Disabled" if you don't want to use the onboard LAN2 controller.

3.6.8 On board LAN2 ROM

The options are "Enabled" and "Disabled". Select "Disabled" if you don't want to use the onboard LAN2 option ROM.

3.7 Power Management Setup

Power Management Setup controls the "green" power-saving features. The following screen shows the manufacturer's defaults.

```
          Phoenix - Award WorkstationBIOS CMOS Setup Utility
                         Power Management Setup

    Power-Supply Type          [ATX]                    Item Help
    ACPI Suspend Type          [S1&S3]
    Power Management Option     [User Define]        Menu Level    ►
    HDD Power Down             [Disabled]
    Video Off Option           [Suspend -> Off]
    Video Off Method           [V/H SYNC+Blank]
    MODEM Use IRQ              [3]
    Soft-Off by PWRBTN         [Instant-Off]
    PWRON After PWR-Fail       [Former-Sts]
    ACPI XSDT Table            [Disabled]
    HPET Support               [Enabled]
    PowerOn by LAN             [Disabled]
    PowerOn by Modem           [Disabled]
    PowerOn By Alarm           [Disabled]
  x Date (of Month)                0
  x Resume Time (hh:mm:ss)     0 :  0 :  0



  ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help
             F5:Previous Values               F7: SetUp Defaults
```

Figure 3.8 Power management setup screen

3.7.1 Power Supply Type

AIMB-221 can support both "ATX" and "AT" power supplies. Customers can choose the PSU type through this selection. The choices are "ATX" and "AT".

3.7.2 ACPI Function

The choices are "Enabled" and "Disabled".

3.7.3 ACPI Suspend Type

This item allows you to set ACPI suspend type to S1/POS (Power On Suspend).

3.7.4 Run VGA BIOS if S3 Resume

This setting allows the system to initialize the VGA BIOS from S3 (Suspend to RAM) sleep state and only works when the ACPI Standby State is set to S3.

3.7.5 Power Management

This category allows you to select the type (or degree) of power saving and is directly related to the following modes:

- HDD Power Down
- Suspend Mode

There are three selections for Power Management, and they have fixed mode settings.

Table 3.1: Power Saving	
Saving Mode	**Function**
Min Saving	Minimum power management, Suspend Mode = 1 hr., and HDD Power Down = 15 min.
Max Saving	Maximum power management, Suspend Mode = 1 min., and HDD Power Down = 1 min.
User Defined (Default)	Allows you to set each mode individually. When not disabled, each of the ranges are from 1 min. to 1 hr. except for HDD Power Down which ranges from 1 min. to 15 min., and disabled.

3.7.6 Video Off Method

Use this to select the method to turn off the video. The choices are "Blank Screen", "V/H SYNC+ Blank" and "DPMS".

3.7.7 Video Off In Suspend

When the system is in suspend mode, the video will turn off. The choices are "No" and "Yes".

3.7.8 Suspend Type

The choices are "Stop Grant" and "PwrOn Suspend".

3.7.9 Suspend Mode

Please refer to 3.7.5.

3.7.10 HDD Power Down

Please refer to 3.7.5.

3.7.11 Soft-Off by PWR-BTTN

If you choose "Instant-Off", then pushing the ATX soft power switch button once will switch the system to "system off" power mode. If you choose "Delay 4 sec" then pushing the ATX soft power button for more than 4 seconds will turn off the system, whereas pushing the button for less than 4 seconds will switch the system to "suspend" mode.

3.7.12 PowerOn by LAN

This item allows you to power on the system via the LAN. The choices are "Enabled" and "Disabled".

3.7.13 PowerOn by Modem

To enable or disable the function to power on the system via a Modem connection from a remote host. The choices are "Enabled" and "Disabled".

3.7.14 USB KB Wake Up From S3

When "Enabled", pressing any key will wake the system up from the S3 state. The choices are "Enabled" and "Disabled".

3.7.15 PowerOn by Alarm

The choices are "Enabled" and "Disabled". The fields that follow, indicate the date and time that the alarm is set for, if enabled.

3.7.16 Primary IDE 0 (1) and Secondary IDE 0 (1)

When Enabled, the system will resume from suspend mode if Primary IDE 0 (1) or Secondary IDE 0 (1) becomes active. The choices are "Enabled" and "Disabled".

3.7.17 FDD, COM, LPT PORT

When Enabled, the system will resume from suspend mode if the FDD, interface, COM port or LPT port is active. The choices are "Enabled" and "Disabled".

3.7.18 PCI PIRQ [A-D]#

When enabled, the system resumes from suspend mode if an interrupt occurs. The choices are "Enabled" and "Disabled".

3.7.19 PWRON After PWR-Fail

Use this to set up the system after power failure. The "Off" setting keeps the system powered off after power failure. The "On" setting boots up the system after failure.

3.8 PnP/PCI Configurations

```
         Phoenix - Award WorkstationBIOS CMOS Setup Utility
                        PnP/PCI Configurations

    Reset Configuration Data    [Disabled]              Item Help

    Resources Controlled By     [Auto(ESCD)]      Menu Level    ▶
  x IRQ Resources                Press Enter
                                                 Default is Disabled.
    PCI/VGA Palette Snoop       [Disabled]       Select Enabled to
    Assign IRQ For VGA          [Enabled]        reset Extended System
    Assign IRQ For USB          [Enabled]        Configuration Data
    PCI Latency Timer(CLK)      [ 64]            ESCD) when you exit
                                                 Setup if you have
    ** PCI Express relative items **             installed a new add-on
    Maximum Payload Size        [4096]           and the system
                                                 reconfiguration has
                                                 caused such a serious
                                                 conflict that the OS
                                                 cannot boot



  ↑↓→←:Move   Enter:Select   +/-/PU/PD:Value   F10:Save   ESC:Exit   F1:General Help
              F5:Previous Values               F7: SetUp Defaults
```

Figure 3.9 PnP/PCI configurations screen

3.8.1 Reset Configuration Data

The default is Disabled. Select Enabled to reset Extended System Configuration Data (ESCD) if you have installed a new add-on card, and system configuration is in such a state that the OS cannot boot.

3.8.2 Resources Controlled By

The commands here are "Auto(ESCD)" or "Manual". Choosing "Manual" requires you to choose resources from the following sub-menu. "Auto(ESCD)" automatically con-figures all of the boot and Plug and Play devices, but you must be using Windows 95 or above.

3.8.3 PCI / VGA Palette Snoop

This is set to "Disabled" by default.

3.8.4 Maximum Payload Size

This allows you to set the maximum TLP payload size for PCIe devices. The options are [128 bytes].

3.9 PC Health Status

```
           Phoenix - Award WorkstationBIOS CMOS Setup Utility
                            PC Health Status
┌──────────────────────────────────────────────┬──────────────────────┐
│ ACPI Shutdown Temp.          [Disabled]        │      Item Help        │
│ CPU Warning Temperature      [Disabled]        │                       │
│ Current System Temp           38°C/ 100°F      │ Menu Level    ▶       │
│ Current CPU1 Temperature      38°C/ 100°F      │                       │
│ Fan1 Speed                     0 RPM           │                       │
│ Fan2 Speed                  5625 RPM           │                       │
│ Vcore                         1.09V            │                       │
│ +12 V                        12.00V            │                       │
│ -12 V                       - 12.29V           │                       │
│ + 5 V                         4.99V            │                       │
│ VBAT (V)                      2.92V            │                       │
│ 5VSB (V)                      4.99V            │                       │
│                                                │                       │
│                                                │                       │
│                                                │                       │
├────────────────────────────────────────────────────────────────────────┤
│ ↑↓→←:Move  Enter:Select  +/-/PU/PD:Value  F10:Save  ESC:Exit  F1:General Help │
│            F5:Previous Values                F7: SetUp Defaults          │
└──────────────────────────────────────────────────────────────────────┘
```
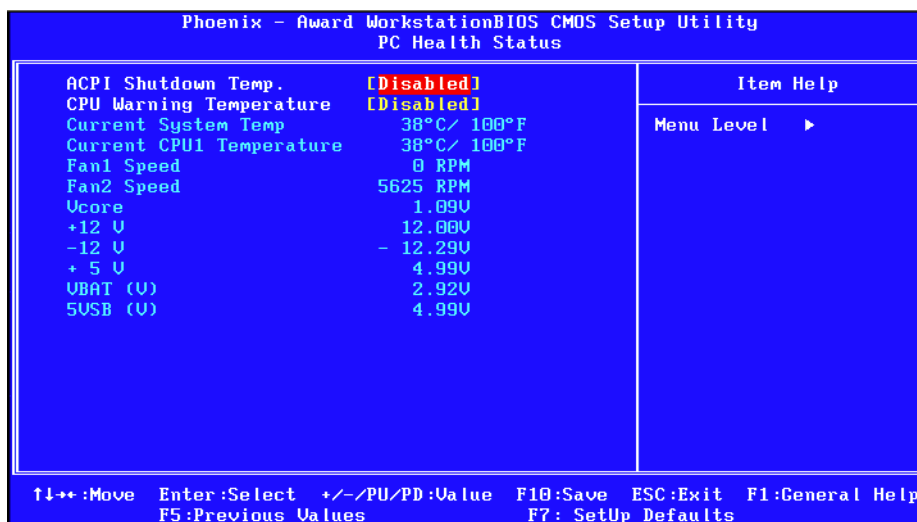
Figure 3.10 PC Health Status Screen

3.9.1 Current System Temperature

This shows you the current temperature of the system.

3.9.2 FAN1: CPU FAN Speed

This shows the current CPU fan speed.

3.9.3 FAN2: System FAN Speed

This shows the current system fan speed.

3.9.4 VCORE and Other Voltages

This shows the voltage of the VCORE, +3.3 V, +5 V, +12 V, -12 V and VBAT(V) power lines.
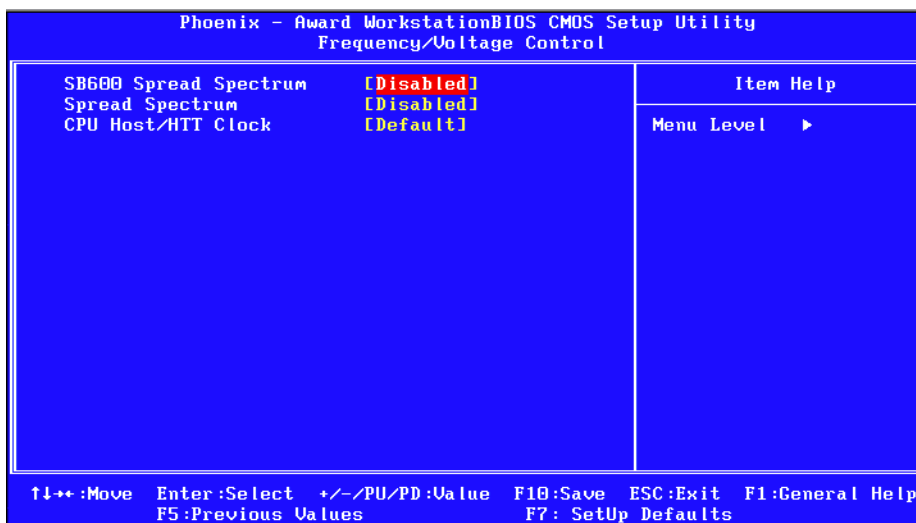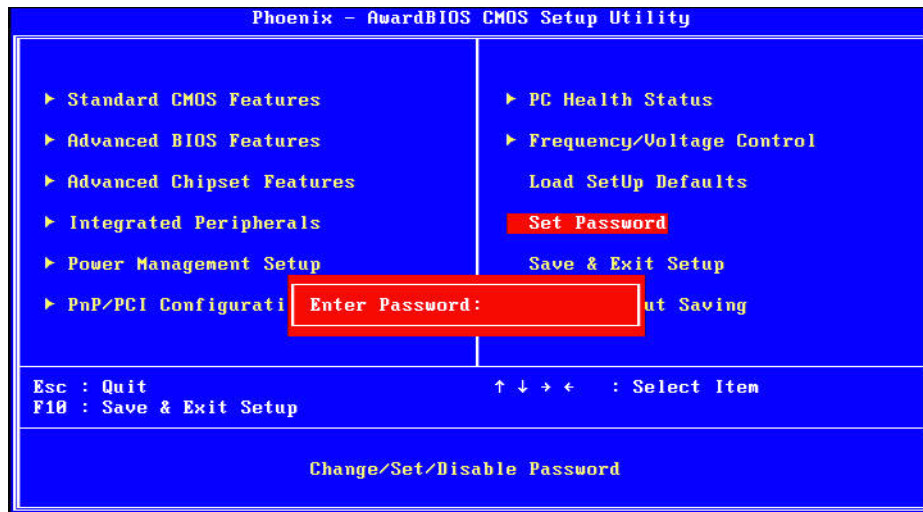
3.10 Frequency / Voltage Control

Figure 3.11 Spread Spectrum Frequency/Voltage Control screen

3.10.1 Spread Spectrum

This setting allows you to reduce EMI by modulating the signals the CPU generates so that the spikes are reduced to flatter curves. This is achieved by varying the frequency slightly so that the signal does not use any particular frequency for more than a moment. The choices are "Disabled" and "Enabled".

3.11 Password Setting

Follow these steps to change the password.

```
              Phoenix - AwardBIOS CMOS Setup Utility

   ▶ Standard CMOS Features            ▶ PC Health Status

   ▶ Advanced BIOS Features            ▶ Frequency/Voltage Control

   ▶ Advanced Chipset Features           Load SetUp Defaults

   ▶ Integrated Peripherals             Set Password

   ▶ Power Management Setup             Save & Exit Setup

   ▶ PnP/PCI Configurati   Enter Password:           ut Saving


   Esc : Quit                   ↑ ↓ → ←   : Select Item
   F10 : Save & Exit Setup

                Change/Set/Disable Password
```

1. Choose the "Set Password" option from the "Initial Setup Screen" menu and press <Enter>. The screen displays the following message:

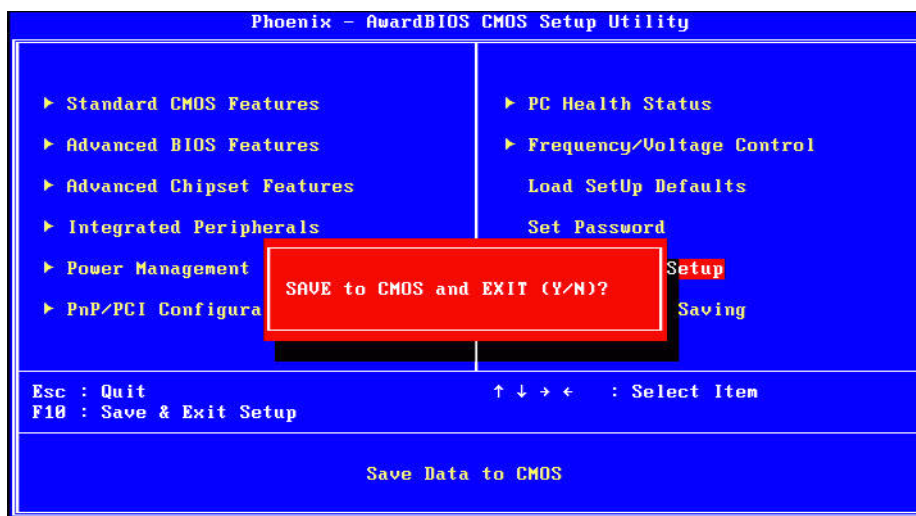> Please Enter Your Password

2. Press <Enter>.
3. If the CMOS is good and this option has been used to change the default password, the user is asked for the password stored in the CMOS. The screen displays the following message:

> Please Confirm Your Password

4. Type the current password and press <Enter>.
5. After pressing <Enter> (ROM password) or the current password (user-defined), you can change the password stored in the CMOS. The password must be no longer than eight (8) characters.

Remember, to enable the password setting feature, you must first select either "Setup" or "System" from the "Advanced BIOS Features" menu.
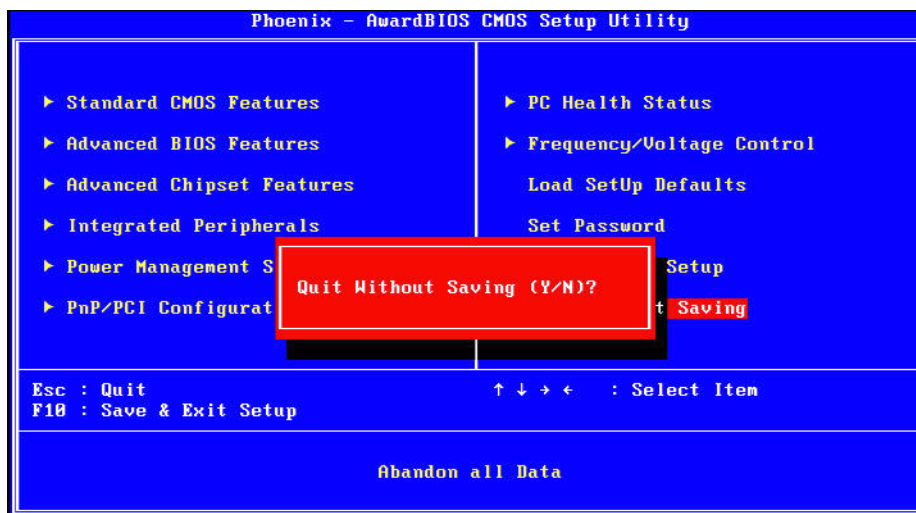
3.12 Save & Exit Setup

```
          Phoenix - AwardBIOS CMOS Setup Utility

  ▶ Standard CMOS Features        ▶ PC Health Status

  ▶ Advanced BIOS Features        ▶ Frequency/Voltage Control

  ▶ Advanced Chipset Features        Load SetUp Defaults

  ▶ Integrated Peripherals           Set Password

  ▶ Power Management    SAVE to CMOS and EXIT (Y/N)?   Setup

  ▶ PnP/PCI Configura                              Saving


  Esc : Quit                    ↑ ↓ → ←   : Select Item
  F10 : Save & Exit Setup

              Save Data to CMOS
```

If you select this and press <Enter>, the values entered in the setup utilities will be recorded in the CMOS memory of the chipset. The processor will check this every time you turn your system on and compare this to what it finds as it checks the system. This record is required for the system to operate.

3.13 Exit Without Saving

Selecting this option and pressing <Enter> lets you exit the setup program without recording any new values or changing old ones.

```
          Phoenix - AwardBIOS CMOS Setup Utility

  ▶ Standard CMOS Features        ▶ PC Health Status

  ▶ Advanced BIOS Features        ▶ Frequency/Voltage Control

  ▶ Advanced Chipset Features        Load SetUp Defaults

  ▶ Integrated Peripherals           Set Password

  ▶ Power Management S                             Setup
                      Quit Without Saving (Y/N)?
  ▶ PnP/PCI Configurat                            t Saving


  Esc : Quit                    ↑ ↓ → ←   : Select Item
  F10 : Save & Exit Setup

              Abandon all Data
```

Note! The screen flickers when switching from BIOS to Windows, which is normal for AMD platforms. This is due to the display switching from text mode to GUI mode.

Chapter 4

Chipset Software Installation Utility and VGA Setup

4.1 Before you begin

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for the AIMB-221 are located on the software installation CD. Microsoft .NET Framework 2.0 are required for AMD/ATI utility. It is strongly suggested to install it first during the driver installation, if the program is missing, please follow the procedural screen below to install it.

Click Next to proceed with the installation
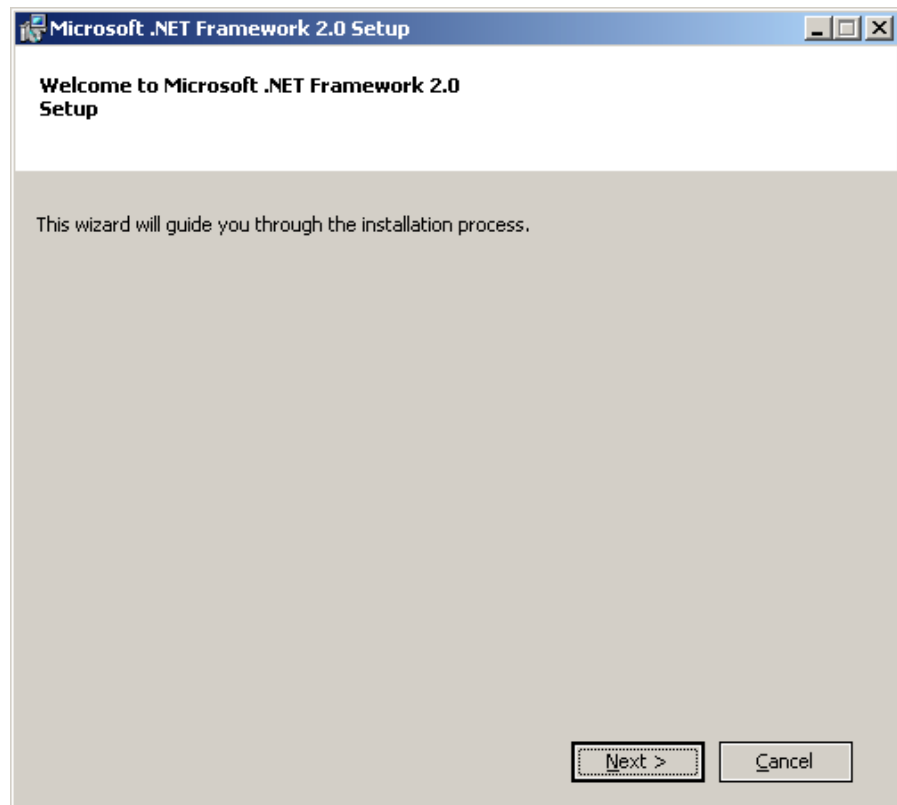
Choose "I accept the terms of the License Agreement" and then click "Install"
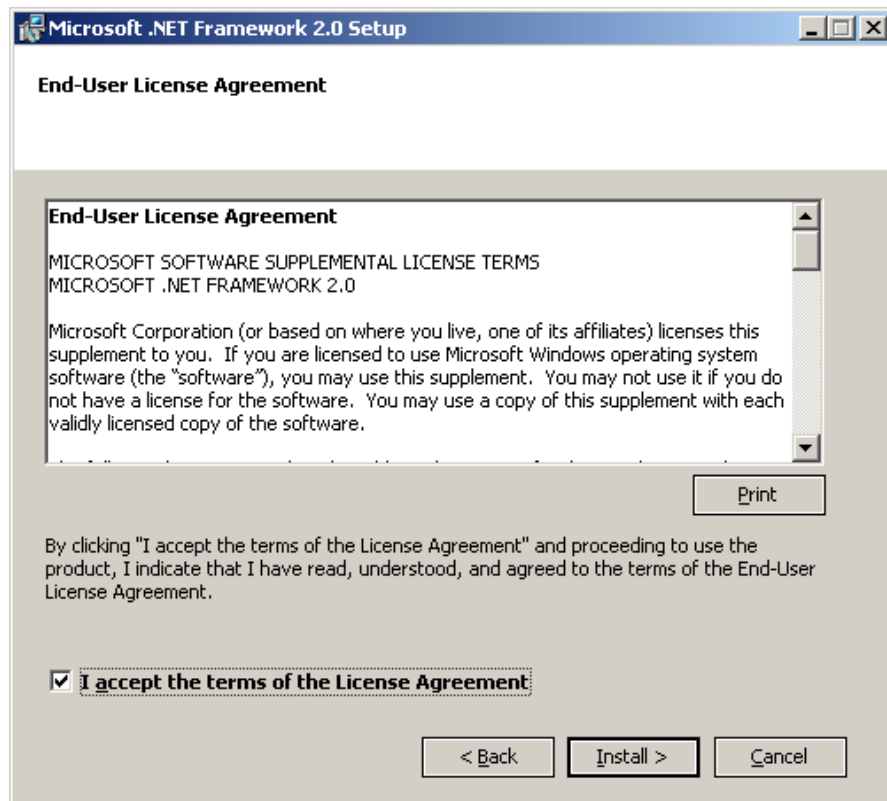
Once the program is installed, click "Finish" to close the installation session.
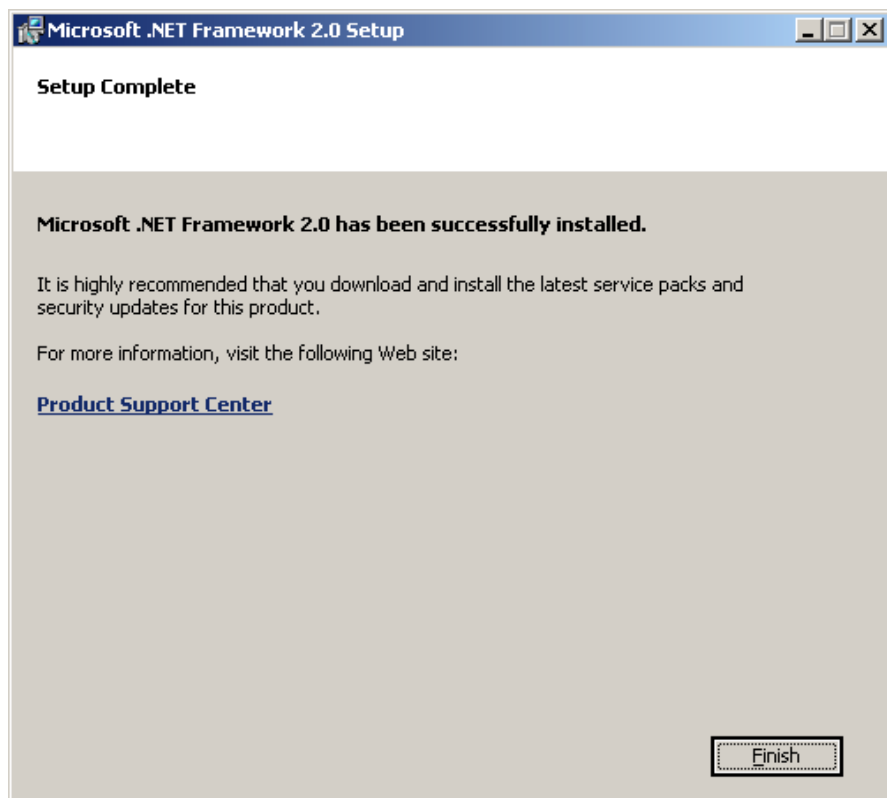
> **Note!** *The files on the software installation CD are compressed. Do not attempt to install the drivers by copying the files manually. You must use the supplied SETUP program to install the drivers.*

Before you begin, it is important to note that most display drivers need to have the relevant software application already installed in the system prior to installing the enhanced display drivers. In addition, many of the installation procedures assume that you are familiar with both the relevant software applications and operating system commands. Review the relevant operating system commands and the pertinent sections of your application software's user manual before performing the installation.
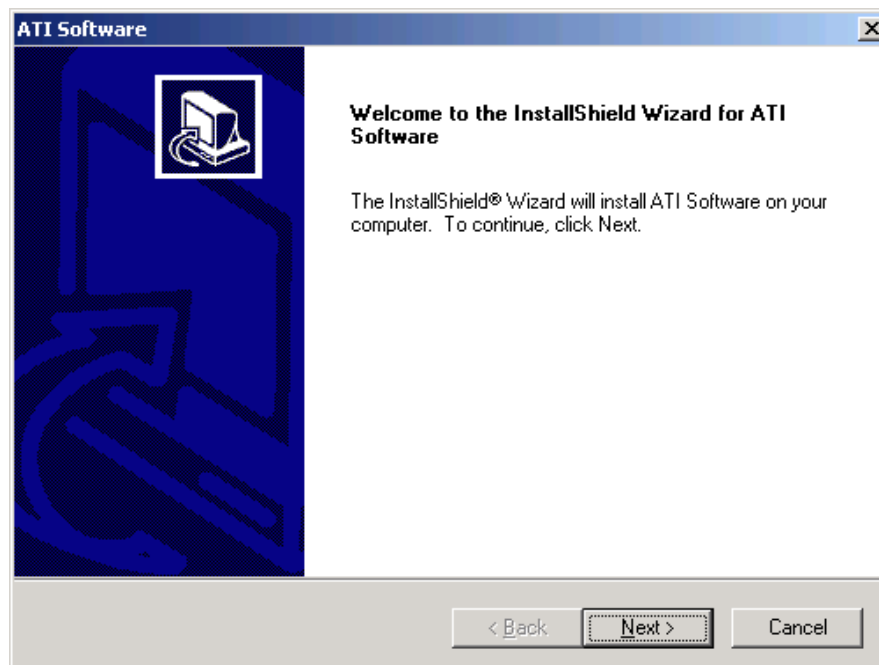
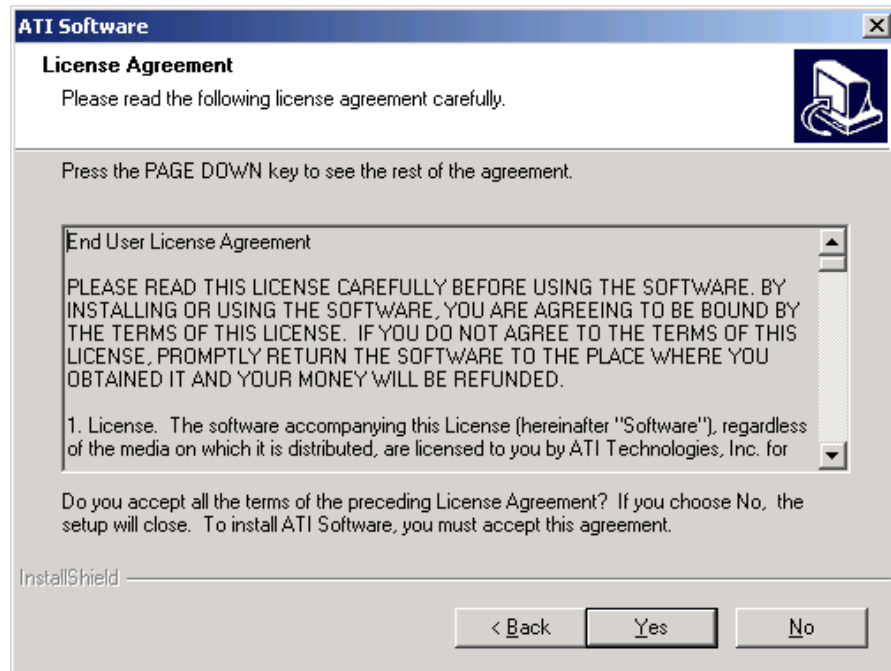## 4.2 Windows XP Driver Setup
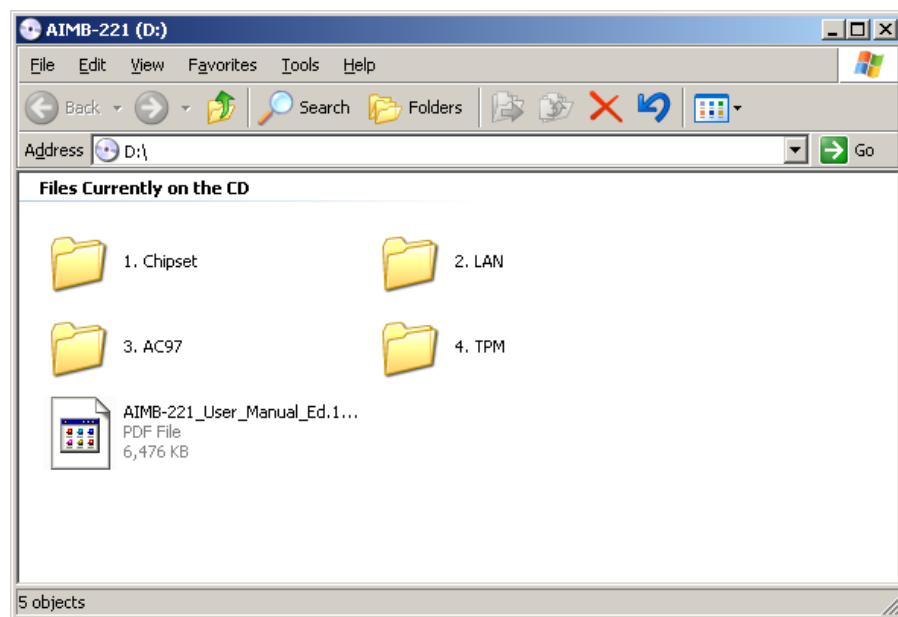
1. Insert the driver CD into your system's CD-ROM drive. Move the mouse cursor to "issetup.exe" and double click it.
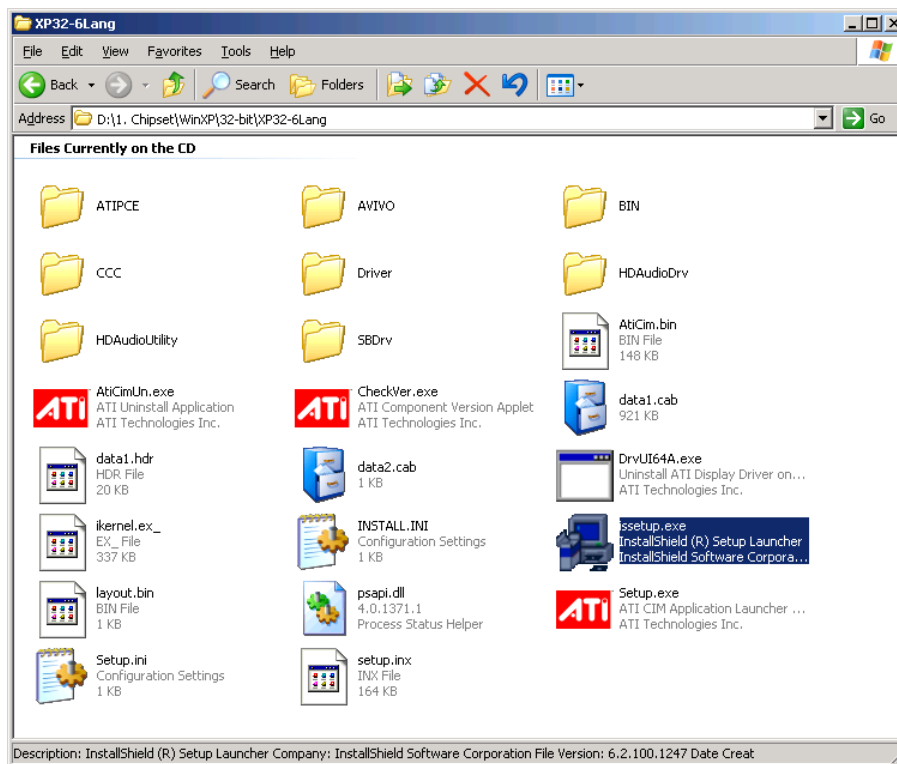
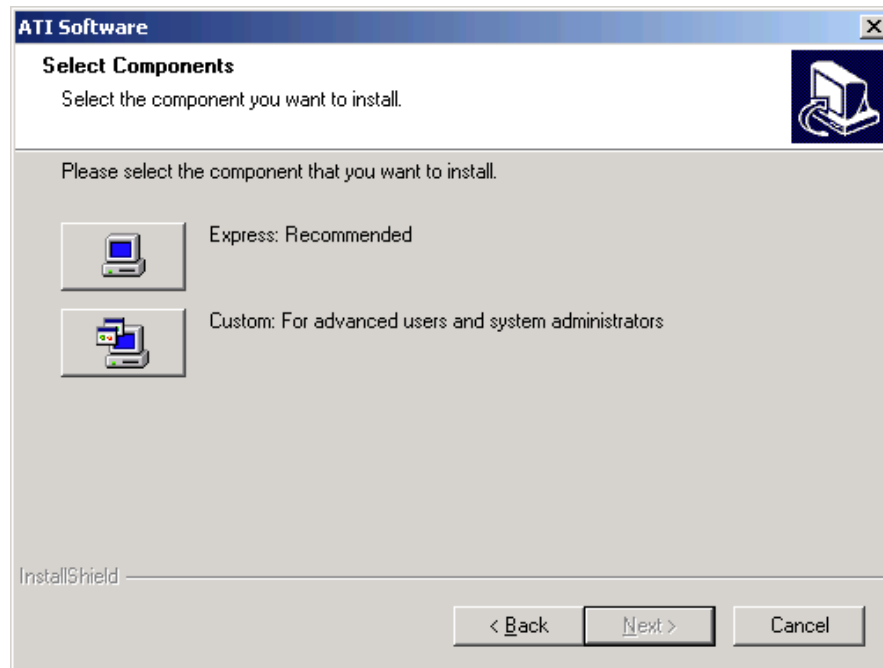2. Click "Next" when you see the following message.

3. Click "Yes" to accept the software license agreement.

4. ATI Display Driver will be installed, click "Express: Recommended" for the auto-run instillation.

Chapter 4 Chipset Software Installation Utility and VGA Setup

5.   Select "Continue Anyway" to skip the ATI X1250 WHQL warning message.

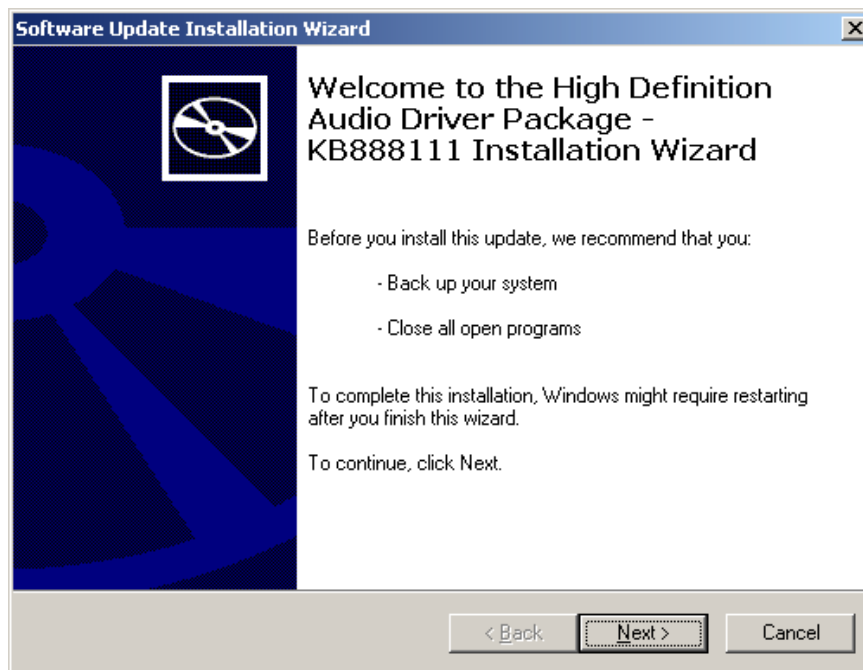77   AIMB-221 User Manual

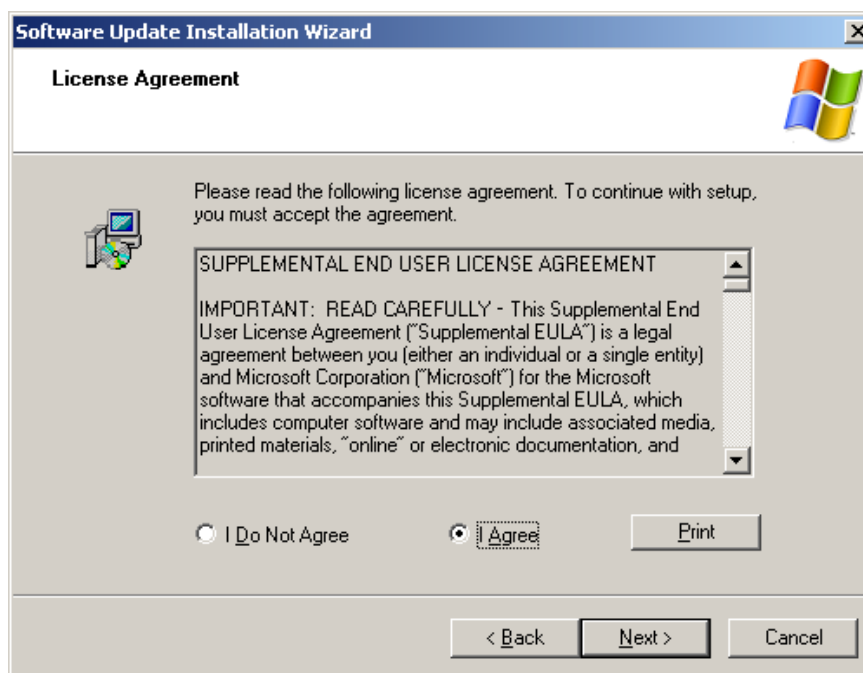6. ATI South Bridge driver will be installed automatically.

7. Once SB600 driver being installed, HDMI Audio driver installation will be started.

8.   Click "Next" to proceed the HD Audio driver installation.
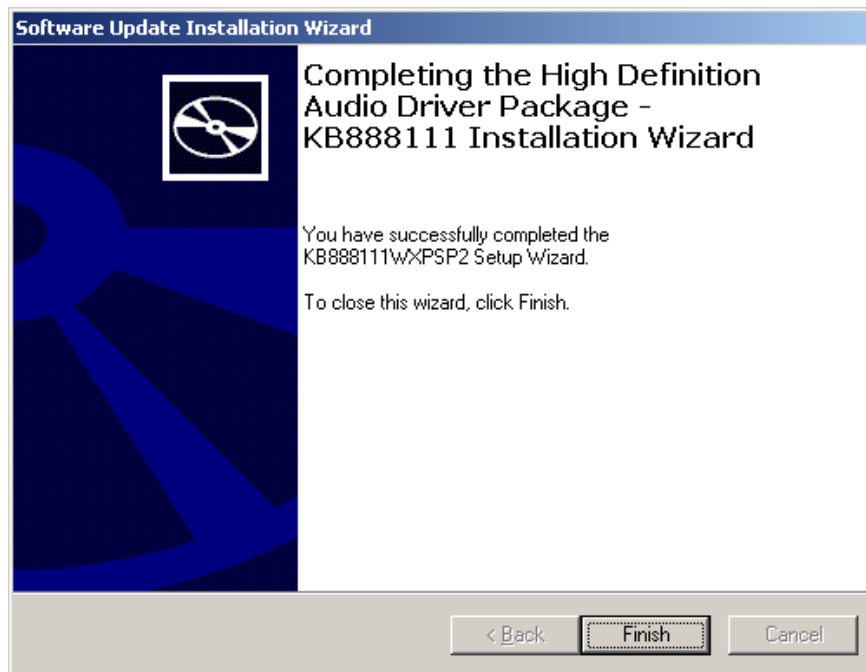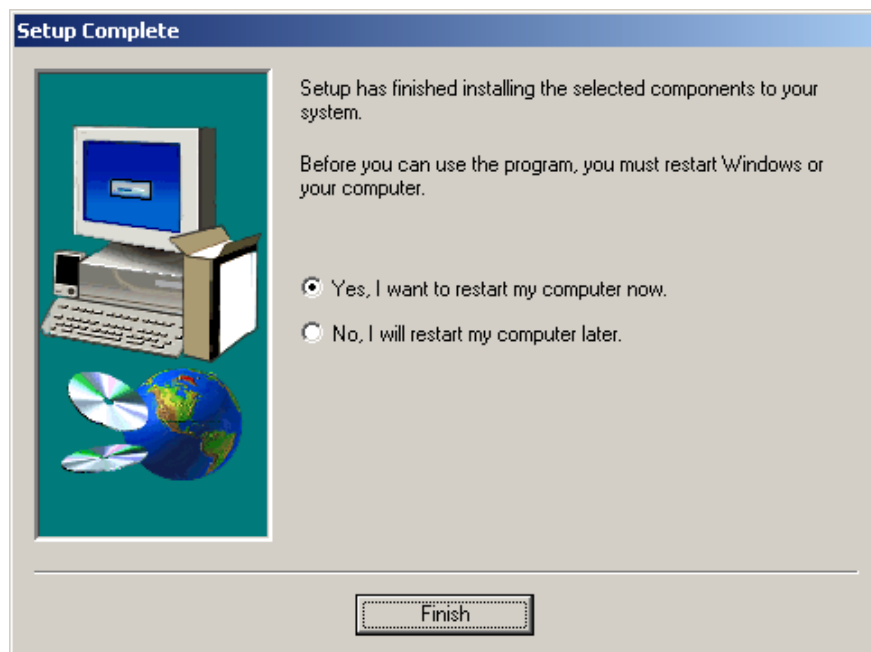

9.   Choose "I Agree" and click "Next" to accept the software license agreement.

10. Click "Finish" to complete the HD Audio Driver installation.

11. Restart the system.

Note! To use Graphic PCI card, please remove the ATI X1250 VGA driver first, and then install the Graphic card driver, to avoid system resource conflicts.

Chapter 5

LAN Configuration

5.1 Introduction

The AIMB-221 has a single/dual Gigabit Ethernet LAN interface (Realtek RTL8111C) that is connected to PCIe x1 link to eliminating network bottlenecks by offering a bandwidth of up to 500 MB/s.

5.2 Features

- Integrated 10/100/1000Base-T transceiver
- 10/100/1000Base-T triple-speed MAC
- High-speed RISC core with 24-KB cache
- On-chip voltage regulation
- Wake-on-LAN (WOL) support
- PCIe x1 host interface

5.3 Installation

The Realtek RTL8111C gigabit Ethernet controller supports all major network operating systems. However, the installation procedure varies with different operating systems. In the following sections, refer to the one that provides the driver setup procedure for the operating system you are using.

5.4 Win XP Driver Setup (LAN)

1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure.
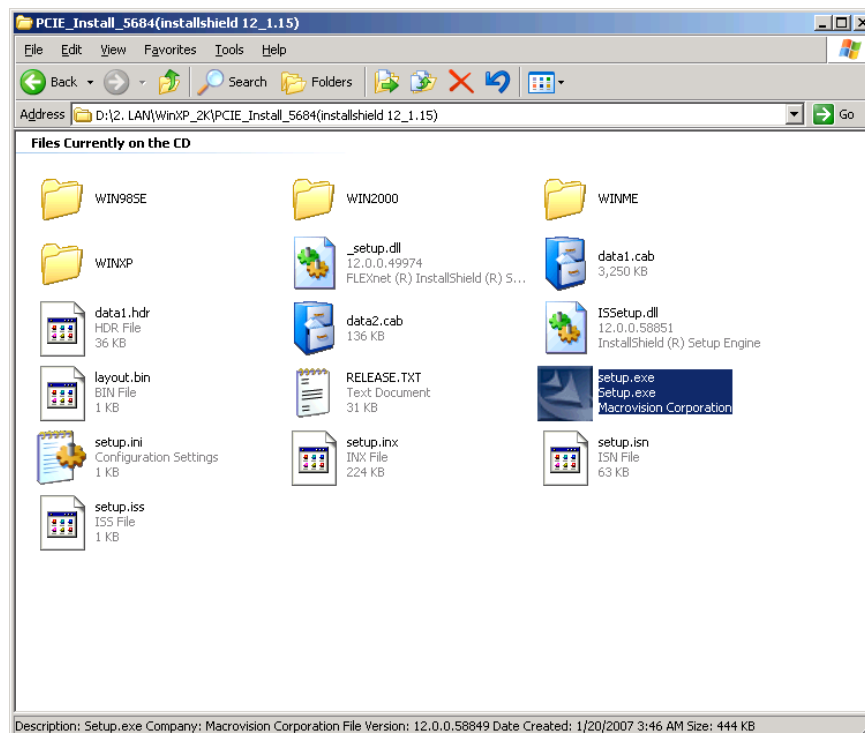
2. You will see a welcome window. Click "Next" to continue the installation.
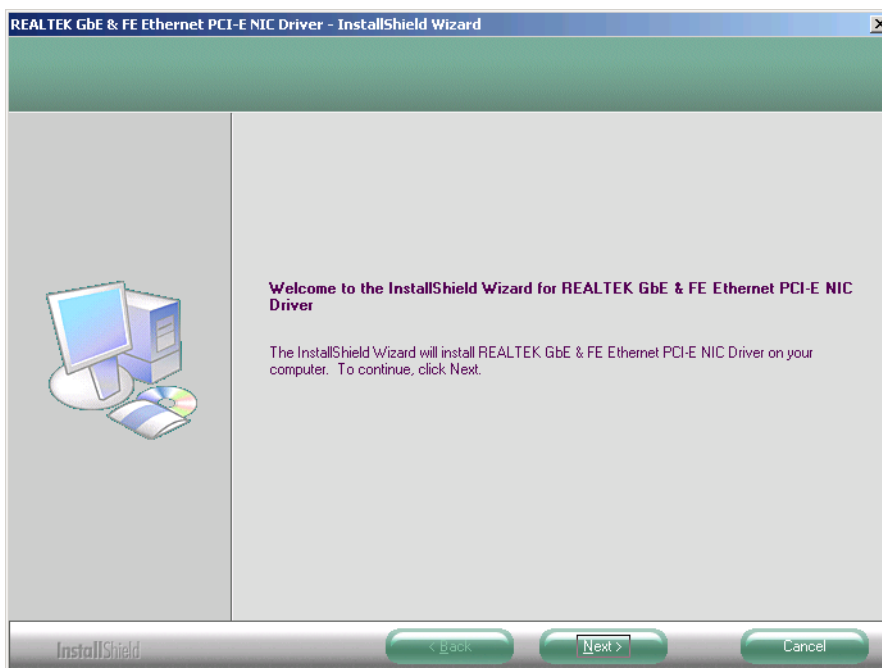
3. Click "Install" to start the installation procedure.
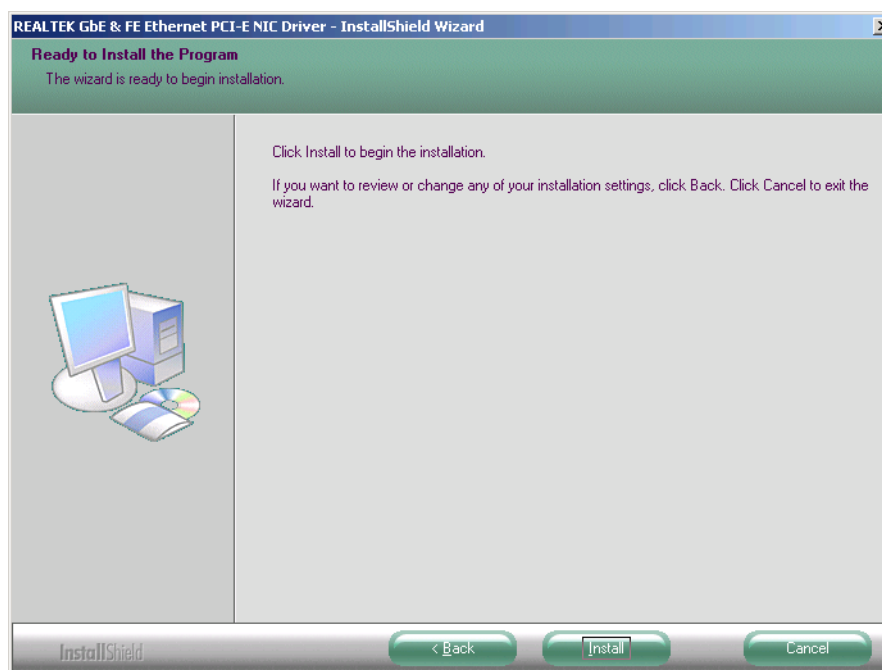
4. Click "Finish" to complete the installation.
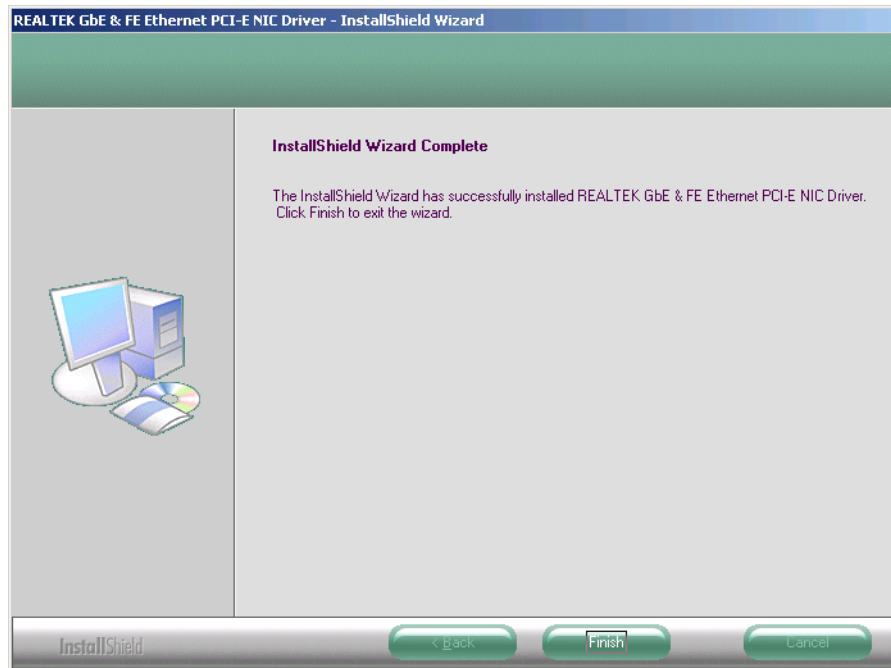
> **Note!**
>
> Due to the Windows kernal limitation, under Win OS [Control Panel] -->
> [Network Connections], the LAN 1 will be shown "Local Area
> Connection2" and the LAN 2 will be shown "Local Area Connection".

Chapter   6

AC97 Audio Setup

6.1 Introduction

Realtek ALC655 is a 16-bit, full-duplex AC'97 Rev. 2.3 compatible six-channel audio CODEC designed for PC multimedia systems, including host/soft audio and AMR/CNR-based designs.

The ALC655 incorporates proprietary converter technology to meet performance requirements for PC99/2001 systems. The ALC655 CODEC provides three pairs of stereo outputs with 5-bit volume control, a mono output, and multiple stereo and mono inputs, along with flexible mixing, gain, and mute functions to provide a complete integrated audio solution for PCs.

# 6.2 Windows XP Driver Setup (AC97)

1. Insert the driver CD into your system's CD-ROM drive. In a few seconds, the software installation main menu appears, as shown in the following figure. Double click "Setup.exe".
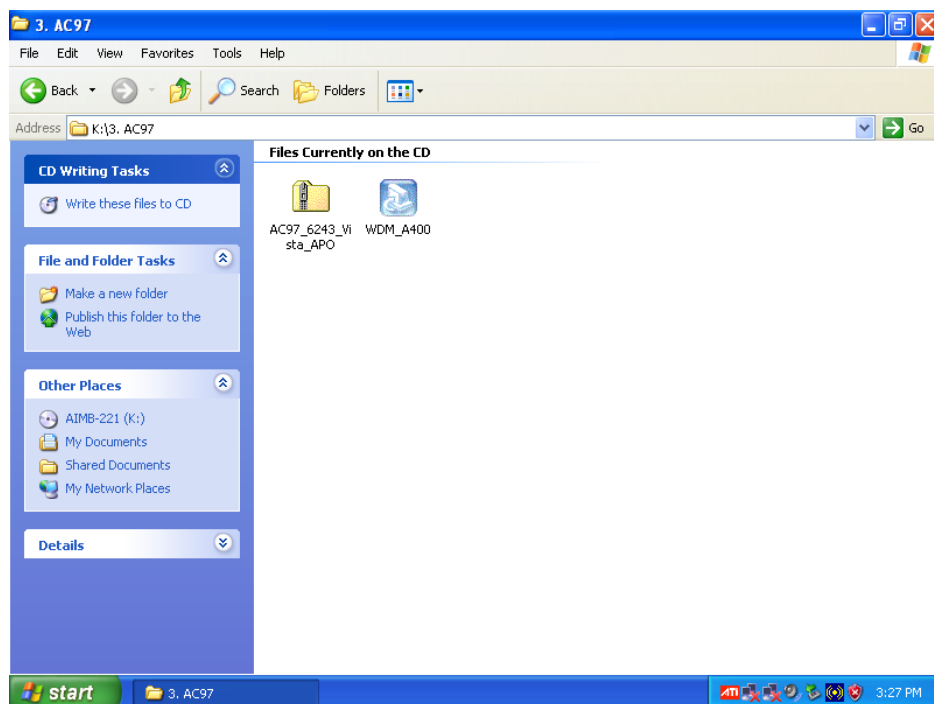
2. Click "Next" to start WDM driver installation.
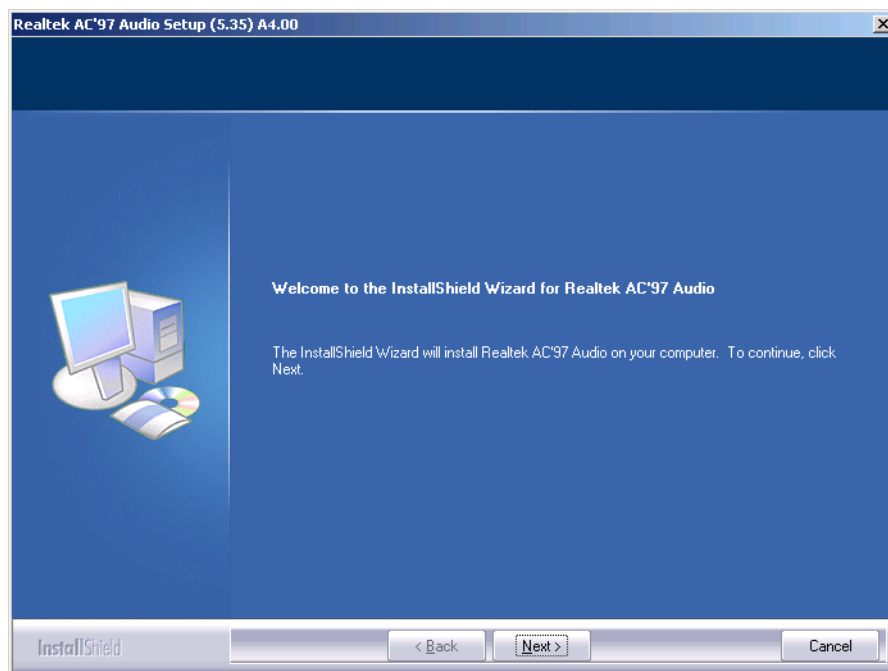
3. The audio driver will be installed automatically. Once it's done, restart the system.
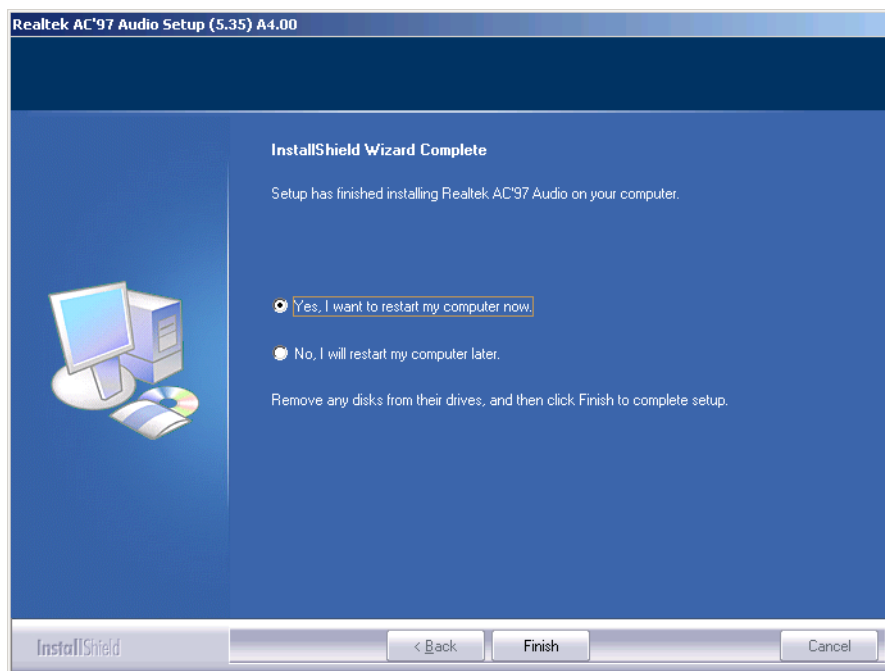
Appendix A

Programming the
Watchdog Timer

The AIMB-221's watchdog timer can be used to monitor system software operation and take corrective action if the software fails to function within the programmed period. This section describes the operation of the watchdog timer and how to program it.

A.1 Watchdog timer overview

The watchdog timer is built in to the super I/O controller W83627HF. It provides the following functions for user programming:

- Can be enabled and disabled by the user's program
- Timer can be set from 1 to 255 seconds or 1 to 255 minutes
- Generates an interrupt or resets signal if the software fails to reset the timer before time-out

A.2 Reset/Interrupt selection

The J2 jumper is used to select reset or interrupt (IRQ) 11 in the event the watchdog timer is tripped. See Chapter 1 for detailed jumper settings.

> *Note!* *The interrupt output of the watchdog timer is a low level signal. It will be held low until the watchdog timer is reset.*

A.3 Programming the Watchdog Timer

The I/O port address of the watchdog timer is 2E (hex) and 2F (hex). 2E (hex) is the address port. 2F (hex) is the data port. You must first write an address value into address port 2E (hex), and then write/read data to/from the assigned register through data port 2F (hex).

```
┌──────────────────────┐
│                      │
│   Unlock W83627UHG   │
│                      │
└──────────────────────┘
          │
          ▼
┌──────────────────────┐
│                      │
│  Select register of  │
│   watchdog timer     │
│                      │
└──────────────────────┘
          │
          ▼
┌──────────────────────┐
│                      │
│ Enable the function of│
│  the watchdog timer  │
│                      │
└──────────────────────┘
          │
          ▼
┌──────────────────────┐
│                      │
│  Use the function of │
│  the watchdog timer  │
│                      │
└──────────────────────┘
          │
          ▼
┌──────────────────────┐
│                      │
│   Lock W83627UHG     │
│                      │
└──────────────────────┘
```
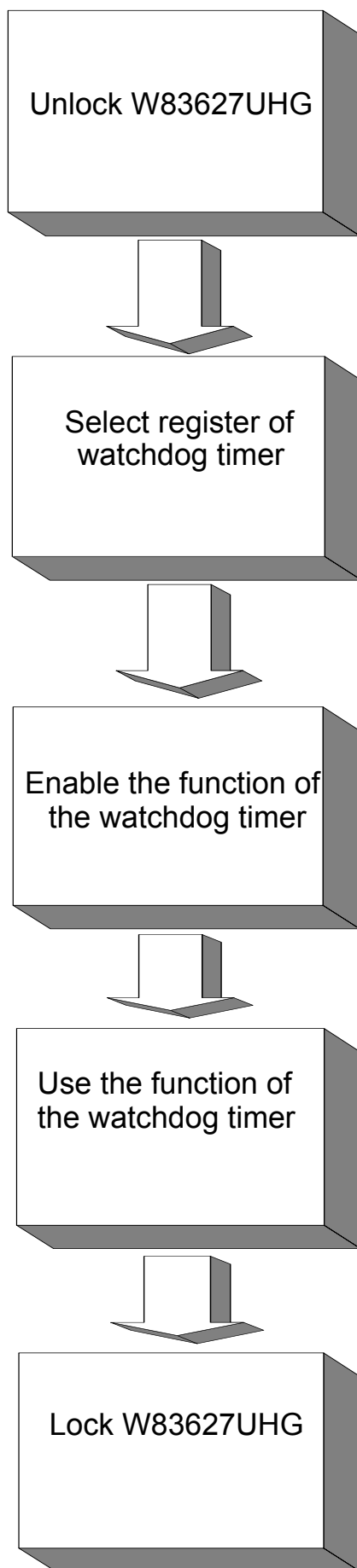
Table A.1: Watchdog timer registers

Address of register (2E)	Read/Write	Value (2F) & description
87 (hex)	-----	Write this address to I/O address port 2E (hex) twice to unlock the W83627HF
07 (hex)	write	Write 08 (hex) to select register of watchdog timer.
30 (hex)	write	Write 01 (hex) to enable the function of the watchdog timer. Disabled is set as default.
F5 (hex)	write	Set seconds or minutes as units for the timer. Write 0 to bit 3: set seconds as counting unit. [default]. Write 1 to bit 3: set minutes as counting unit.
F6 (hex)	write	0: stop timer [default] 01 ~ FF (hex): The amount of the count, in seconds or minutes, depends on the value set in register F5 (hex). This number decides how long the watchdog timer waits for strobe before generating an interrupt or reset signal. Writing a new value to this register can reset the timer to count with the new value.
F7 (hex)	read/write	Bit 6: Write 1 to enable keyboard to reset the timer, 0 to disable.[default] Bit 5: Write 1 to generate a timeout signal immediately and automatically return to 0. [default=0] Bit 4: Read status of watchdog timer, 1 means timer is "timeout".
AA (hex)	-----	Write this address to I/O port 2E (hex) to lock the watchdog timer 2.

A.3.1 Example Programs

Enable watchdog timer and set 10 seconds as the timeout interval

```
;---------------------------------------------------------
Mov dx,2eh          ; Unlock W83627HF
Mov al,87h
Out dx,al
Out dx,al
;---------------------------------------------------------
Mov al,07h          ; Select registers of watchdog timer
Out     dx,al
Inc     dx
Mov     al,08h
Out     dx,al
;---------------------------------------------------------
Dec dx              ; Enable the function of watchdog timer
Mov     al,30h
Out     dx,al
Inc     dx
Mov     al,01h
Out     dx,al
;---------------------------------------------------------
```

```
Dec dx              ; Set second as counting unit
Mov     al,0f5h
Out     dx,al
Inc     dx
In      al,dx
And al,not 08h
Out     dx,al
;-------------------------------------------------------
Dec dx              ; Set timeout interval as 10 seconds and start counting
Mov     al,0f6h
Out     dx,al
Inc     dx
Mov     al,10
Out     dx,al
;-------------------------------------------------------
Dec dx              ; lock W83627HF
Mov     al,0aah
Out     dx,al
Enable watchdog timer and set 5 minutes as the timeout interval
;-------------------------------------------------------
Mov dx,2eh          ; unlock W83627HF
Mov al,87h
Out dx,al
Out dx,al
;-------------------------------------------------------
Mov al,07h          ; Select registers of watchdog timer
Out     dx,al
Inc     dx
Mov     al,08h
Out     dx,al
;-------------------------------------------------------
Dec dx              ; Enable the function of watchdog timer
Mov     al,30h
Out     dx,al
Inc     dx
Mov     al,01h
Out     dx,al
;-------------------------------------------------------
Dec dx              ; Set minute as counting unit
Mov     al,0f5h
Out     dx, al
Inc     dx
In      al,dx
Or  al, 08h
Out     dx,al
```

```
;--------------------------------------------------------
Dec dx                  ; Set timeout interval as 5 minutes and start counting
Mov     al,0f6h
Out     dx,al
Inc     dx
Mov     al,5
Out     dx,al
;--------------------------------------------------------
Dec dx                  ; lock W83627HF
Mov     al,0aah
Out     dx,al
Enable watchdog timer to be reset by mouse
;--------------------------------------------------------
Mov dx,2eh              ; unlock W83627HF
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h              ; Select registers of watchdog timer
Out     dx,al
Inc     dx
Mov     al,08h
Out     dx,al
;--------------------------------------------------------
Dec dx                  ; Enable the function of watchdog timer
Mov     al,30h
Out     dx,al
Inc     dx
Mov     al,01h
Out     dx,al
;--------------------------------------------------------
Dec dx                  ; Enable watchdog timer to be reset by mouse
Mov     al,0f7h
Out     dx,al
Inc     dx
In      al,dx
Or  al,80h
Out     dx,al
;--------------------------------------------------------
Dec dx                  ; lock W83627HF
Mov     al,0aah
Out     dx,al
Enable watchdog timer to be reset by keyboard
;--------------------------------------------------------
Mov dx,2eh              ; unlock W83627HF
```

```
Mov al,87h
Out dx,al
Out dx,al
;-------------------------------------------------------
Mov al,07h            ; Select registers of watchdog timer
Out     dx,al
Inc     dx
Mov     al,08h
Out     dx,al
;-------------------------------------------------------
Dec dx                ; Enable the function of watchdog timer
Mov     al,30h
Out     dx,al
Inc     dx
Mov     al,01h
Out     dx,al
;-------------------------------------------------------
Dec dx                ; Enable watchdog timer to be strobed reset by keyboard
Mov     al,0f7h
Out     dx,al
Inc     dx
In      al,dx
Or   al,40h
Out     dx,al
;-------------------------------------------------------
Dec dx                ; lock W83627HF
Mov     al,0aah
Out     dx,al
Generate a time-out signal without timer counting
;-------------------------------------------------------
Mov dx,2eh        ; unlock W83627HF
Mov al,87h
Out dx,al
Out dx,al
;-------------------------------------------------------
Mov al,07h            ; Select registers of watchdog timer
Out     dx,al
Inc     dx
Mov     al,08h
Out     dx,al
;-------------------------------------------------------
Dec dx            ; Enable the function of watchdog timer
Mov     al,30h
Out     dx,al
Inc     dx
```

```
        Mov    al,01h
        Out    dx,al
;------------------------------------------------------------
Dec dx                  ; Generate a time-out signal
        Mov    al,0f7h
        Out    dx,al      ;Write 1 to bit 5 of F7 register
        Inc    dx
        In     al,dx
        Or   al,20h
        Out    dx,al
;------------------------------------------------------------
Dec dx                  ; lock W83627HF
        Mov    al,0aah
        Out    dx,al
```